MONTHLY WEATHER REVIEW.

Editor: Prof. CLEVELAND ABBE.

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INTRODUCTION.

The REVIEW for October, 1895, is based on reports from 2,760 stations occupied by regular and voluntary observers, classified as follows: 149 from Weather Bureau stations; 35 from U. S. Army post surgeons; 2,416 from voluntary observers; 34 from Canadian stations; 96 received through the Southern Pacific Railway Company; 30 from U. S. Life-Saving stations; international simultaneous observations are received from a few stations and used together with trustworthy newspaper extracts and special reports.

The WEATHER REVIEW is prepared under the general editorial supervision of Prof. Cleveland Abbe. Unless otherwise specifically noted, the text is written by the Editor, but the statistical tables are furnished by Mr. A. J. Henry, Chief of the Division of Records and Meteorological Data. A special acknowledgment is made of the hearty cooperation of Prof. R. F. Stupart, Director of the Meteorological Service of the Dominion of Canada.

CLIMATOLOGY OF THE MONTH.

GENERAL CHARACTERISTICS.

The mean temperature was generally deficient. Precipitation was deficient everywhere, except in southern Florida. High pressure and clear skies generally prevailed. The drought in the Ohio Valley continued severe. Local storms of all kinds were remarkably infrequent. Hurricanes from the West Indian region approached our coasts, but turned off before doing much damage. Unusual storms visited the Gulf of California and the Pacific coast of Mexico. The earthquake of the 31st was widely felt; it was most severe in southeastern Missouri and southern Illinois, but did only slight damage.

ATMOSPHERIC PRESSURE.

[In inches and hundredths.]

The distribution of mean atmospheric pressure reduced to sea level, as shown by mercurial barometers, not reduced to standard gravity, and as determined from observations taken daily at 8 a. m. and 8 p. m. (seventy-fifth meridian time), is shown by isobars on Chart II. That portion of the reduction to standard gravity that depends on latitude is shown by the numbers printed on the right-hand border.

The *mean pressures* during the current month were highest along a narrow ridge extending from Alabama and Tennessee westward to Oklahoma and Kansas, and thence northwest into British Columbia.

The highest were: Lander, 30.22; Cheyenne and Denver, 30.18; North Platte and Kansas City, 30.17. The lowest mean pressures were in southern California and Arizona, and pressure was also low north of the Lake Region and the mouth of the St. Lawrence.

The lowest were: Yuma, 29.86; Bird Rocks, 29.87; and Father Point, 29.90.

As compared with the normal for October, the mean pressure was in excess over the whole interior of the United States, and highest over the region between Oklahoma and Alberta.

The greatest excesses were: Lander, 0.14; Denver and Wichita, 0.12; Cheyenne, North Platte, Dodge City, and Pueblo, 0.11.

Pressure was deficient in Oregon, California, and Arizona, and also in the northern portion of the Lake Region.

The greatest deficits were: Rockliffe, 0.10; Block Island, 0.06; Nantucket, Portland, Me., Marquette, and Roseburg, 0.06; Yuma and Sacramento, 0.05.

As compared with the preceding month of September, the pressures, reduced to sea level, show a very general rise over the whole country west of the lower Lake Region and South Atlantic States. The greatest rises were: Cheyenne, 0.26; Denver and Lander, 0.25; Pueblo and Huron, 0.23; Concordia, Sioux City, Pierre, and Miles City, 0.22. The greatest falls were: Key West, Jupiter, and Nantucket, 0.04; Rockliffe, 0.03.

AREAS OF HIGH AND LOW PRESSURE.

[By Prof. FRANK H. BIGELOW.]

The tracks of thirteen areas of high pressure are plotted on Chart IV for the month of October. This chart shows that these tracks are confined almost exclusively to the southern circuit, only one having crossed the Great Lakes. Instead of originating near the coast line, as in summer, they showed a marked tendency to form along the high land of the mountain plateau; they spread southeastward along the Slope, five of them reaching the Atlantic coast, and two the Gulf of St. Lawrence.

The tracks of fifteen areas of low pressure are plotted on Chart I. Without exception all of these appeared first in the northwest, near the northern boundary of the United States, and moved east in the northern circuit, very near the axis of the mean storm track. There are only four unimportant departures from this mean course noted during the entire month. These depressions passed to the south and east of Florida, as West India cyclones, whose tracks remained so far out at sea as to make it difficult to plot correctly the real track followed; another slight disturbance occurred in the west Gulf.

Taken altogether the month of October presents a remarkable case of conformity to the normal conditions of the season. The location of the high and the low tracks is so distinct that from it the mean type of the weather, which is usually broken in upon by abnormal conditions, may be inferred. The month was generally dry, and the precipitation was confined in a simple way to the fronts of the advancing highs.

Movements of centers of areas of high and low pressure.

Number.	First observed.			Last observed.			Path.		Average velocities.	
	Date.	Lat. N.	Long. W.	Date.	Lat. N.	Long. W.	Length.	Duration.	Daily.	Hourly.
High areas.		°	°		°	°	*Miles.*	*Days.*	*Miles.*	*Miles.*
I	1, a. m.	38	87	2, p. m.	37	80	690	1.5	460	19.1
II	2, a. m.	44	125	5, a. m.	41	96	1,820	3.0	607	25.2
III	2, a. m.	50	96	4, p. m.	48	65	1,490	2.5	596	24.7
IV	5, p. m.	41	113	6, a. m.	42	112	120	0.5	.....	.....
V	6, a. m.	50	114	12, p. m.	46	59	3,570	6.5	580	24.1
VI	9, a. m.	46	123	13, p. m.	35	88	2,500	4.5	555	23.0
VII	12, p. m.	51	109	19, a. m.	35	76	4,110	6.5	632	26.2
VIII	17, a. m.	50	120	22, p. m.	46	64	4,160	5.5	756	31.4
IX	20, a. m.	44	113	25, p. m.	47	81	3,760	6.5	578	24.0
X	24, a. m.	43	110	25, p. m.	40	115	1,010	1.5	673	27.9
XIa	26, a. m.	47	117	28, a. m.	43	100	1,230	2.0	615	25.5
XIb	27, a. m.	43	105	27, p. m.	35	100	630	0.5	.....	.....
XII	27, p. m	51	105	31, p. m.	47	61	2,970	4.0	743	30.9
XIII	30, p. m.	53	103	31, p. m.	54?	100?	1,460?	1.0	.....	.....
Sums	.....	.....	.....	.....	.....	.....	29,510	46.0	6,765	.....
Mean of 11 paths	.....	.....	.....	.....	.....	.....	.....	.....	615	25.6
Mean of 46.0 days	.....	.....	.....	.....	.....	.....	.....	.....	642	26.6
Low areas.										
I	1, a. m.	34	82	7, a. m.	48	55	2,490	6.0	415	17.3
II	1, a. m.	50	97	2, p. m.	49	68	1,470	1.5	980	40.7
III	1, a. m.	47	123	4, a. m.	49	98	2,310	3.0	770	32.0
IV	4, p. m.	52	117	9, a. m.	47	59	2,790	4.5	602	25.0
V	8, a. m.	53	112	15, a. m.	49	54	3,770	7.0	539	22.4
VI	11, a. m.	54	114	13, a. m.	48	86	1,330	2.0	665	27.5
VII	14, p. m.	53	115	18, p. m.	46	57	2,860	4.0	715	29.5
VIII	15, a. m.	25	79	16, a. m.	27	79	130	1.0	130	5.4
IX	16, p. m.	50	115	20, p. m.	48	58	2,750	4.0	688	28.6
X	19, p. m.	55	114	23, p. m.	47	60	2,840	4.0	710	29.5
XI	19, p. m.	18	80	23, a. m.	34	74	1,190	3.5	340	14.1
XII	23, a. m.	54	110	26, a. m.	47	57	2,600	3.0	867	36.0
XIII	24, p. m.	52	112	29, a. m.	65	50	2,490	4.5	553	23.0
XIV	30, a. m.	28	97	31, a. m.	30	89	510	1.0	510	21.2
XV	30, a. m.	52	95	31, p. m.	40	75	1,320	1.5	880	36.5
Sums	.....	.....	.....	.....	.....	.....	30,850	50.5	9,364	.....
Mean of 15 paths	.....	.....	.....	.....	.....	.....	.....	.....	624	25.9
Mean of 50.5 days	.....	.....	.....	.....	.....	.....	.....	.....	611	25.4

HIGH AREAS.

I.—The month of October opened with a very extensive high covering the entire United States, being central in southern Indiana. It moved eastward to Virginia, and on the 3d was merged into high No. III, that had advanced to the Lake Region. Killing and light frosts occurred in the Lake Region, the upper Mississippi and Ohio valleys, and the Middle Atlantic States, as far south as North Carolina. They continued with less intensity on the mornings of the 2d and 3d.

II.—This area and No. VI are the only ones plotted on the immediate Pacific Coast during the month. No. II began on the 2d, crossed the northern Plateau on the 3d, and disappeared on the 5th, along the eastern slope with the center in the Missouri Valley. Some light showers occurred on the Rocky Mountain Slope during the 3d and 4th, and a slight temperature fall accompanied the high.

III.—A high formed in the upper Mississippi Valley on the 2d and moved eastward to the Gulf of St. Lawrence by the 4th. It contributed to the frosts of the 3d and 4th, but otherwise gives no feature for observation.

IV.—This was a sporadic high in Utah on the 5th and 6th, surviving only one day, when it was drawn into a stronger high to the north of it.

V.—The next high appeared during the 6th to the north of Montana, and advanced to North Dakota on the 7th, Missouri on the 8th, West Virginia on the 9th, the North Carolina coast on the 10th, and Nova Scotia on the 12th, where it disappeared. It brought frosts on the 8th in the Missouri Valley and the upper Mississippi Valley, on the 9th in the middle Mississippi Valley, on the 10th generally east of the Mississippi River, and on the 11th in New England. The weather was dry during this interval, and a moderate temperature fall accompanied the eastward progress of the high.

VI.—This high pressure area appeared on the north Pacific Coast on the 9th, passed into Idaho on the 10th, moved down the middle Slope to Kansas on the 11th, to northern Texas on the 12th; on this date it divided, one center being located in northern Texas and the other in Illinois, but these united again on the 13th, in Tennessee, where the high disappeared. After crossing the mountains showers appeared in front of it in the Mississippi Valley on the 11th and 12th, followed by frost in the same districts on the morning of the 13th. The temperature fall accompanying the high was small.

VII.—On the 12th a high formed in Alberta, which moved slowly southward over the mountain slope into Colorado by the 15th, where it remained with uncertain location of the center during the 16th; thence advanced more rapidly eastward to Tennessee by the 17th, and to the North Carolina coast by the 18th, where it faded away on the 19th. During its entire course it was almost entirely free from precipitation in its neighborhood, and from frost, the changes in temperature at the same time being very slight.

VIII.—This high had a long track and its movement was quite rapid. It passed from the State of Washington on the 17th into Alberta on the 18th, and Oklahoma on the 19th, lingered in northern Texas on the 20th, turned to the northeast with a rapid movement, reaching Massachusetts on the 21st and Nova Scotia on the 22d, where it disappeared. Aside from some frosts in the lower Mississippi Valley on the 20th, and in the eastern Gulf States on the 21st, there is little to remark. A hurricane developed over the West Indies, which passed northeast near the Bahama Channel on the 21st and 22d; this was probably sustained to some extent by the action of this high.

IX.—The course of this high extended from the northern Rocky Mountain Plateau southeastward to the Florida Peninsula, though for a portion of the time it could hardly be distinguished from the normal pressures of the Gulf States. It began in Idaho on the 20th, moved northward to Montana on the 21st, and into Alberta on the morning of the 22d, whence it turned and worked quickly southeastward, reaching Missouri on the 23d, the North Carolina coast on the 24th, and the Florida Peninsula on the 25th, falling to the normal on the 26th. A few light showers occurred in Kentucky, Tennessee, and North Carolina on the 25th, but otherwise the weather was nearly dry throughout this interval. A temperature fall of 10° to 20° attended the advance of this high, but few frosts were reported.

X.—On the 24th and 25th a high covered the middle Plateau, hardly to be distinguished from the preceding number, and forming with it an almost continuous high belt, near the normal axis of the annual high.

XI.—The location of the center of high pressure in the Rocky Mountains on the 26th to 28th is uncertain. Apparently it was highest in Washington on the 26th, and in Wyoming on the 27th, when a division took place; one portion remained in Wyoming and South Dakota on the 28th, where it disappeared; the second center moved into northern Texas on the 27th, when this passed away from observation. The first center may be described as having been absorbed in No. XII, which formed to the northward of it. Some rain fell in the central Mississippi Valley on the 27th, and a little frost followed on the 28th in the same locality. The temperature changes amounted from 20° to 30° in the Rocky Mountain Slope Region.

XII.—This high formed to the north of Montana on the 27th, and remained near the same place during the 28th, whence it moved to Missouri on the 29th, to Vermont on the 30th, and to the Gulf of St. Lawrence on the 31st. Nos. V, VIII, XII, pursued nearly the same track, and are interesting as showing the normal formation and movements of highs in the United States. On the 30th some quite heavy rains fell to the southwest of the high in Texas and the neighboring States, the barometer being generally above the normal, except on the western Gulf Coast. During this time a cyclonic area was forming in the west Gulf, which appeared distinctly on the 31st (see low area No. XIV). The passage of this high was unattended by frosts, and the temperatures were nearly stationary.

XIII.—The last high of the month appeared in the Saskatchewan Valley on the 30th, moved directly southward to Texas on the 31st, though it covered the mountain districts generally during this time, and continued so at the end of the month.

AREAS OF LOW PRESSURE.

I.—On the morning of the 1st there was evidence of a cyclonic disturbance to the south of the Florida Peninsula, the center not being clearly determined, though the barometer reading 29.80 was reported at Habana, with high northeasterly winds over southern Florida. The conditions did not materially change during the 2d, but on the 3d it was evident that a northeasterly track was to be expected, and the center was located to the eastward of Florida, with a barometer of 29.76 at Nassau, and northerly winds over the peninsula. Considerable swell was reported along the south Atlantic coast, but apparently there was no other very violent action of the storm. On the 4th the barometer had risen to 29.88 at Habana, and to 29.82 at Nassau. After this a moderate depression advanced rapidly up the Atlantic coast, with center undetermined to the eastward, being opposite New Jersey on the 5th, Nova Scotia on the 6th, and Newfoundland on the 7th.

II.—On the morning of the 1st, an insignificant depression was central in the valley of the Red River of the North, which passed to the Gulf of St. Lawrence by the evening of the 2d, producing very little effect upon the weather.

III.—Also on the 1st a third depression existed on the north Pacific coast, which moved eastward to Manitoba on the 2d, was deflected southward to Nebraska on the 3d, but returned to the northern circuit on the 4th, where it disappeared, causing very slight changes in the weather conditions.

IV.—On the 4th a low center formed over Alberta, moved steadily eastward to Lake Superior on the 6th, and to the Gulf of St. Lawrence on the 8th. It developed a trough toward the southwest on the 6th, and rain fell in the Mississippi Valley, the rain area extended to the Atlantic States, with occasional showers and a few thunderstorms on the 7th and 8th; its influence ended on the 9th.

V.—This storm was of moderate intensity, and began in Alberta on the 8th, moved to North Dakota on the 9th, to Lake Superior on the 10th, where a little rain fell over the Lakes, to Lake Erie on the 11th, a small rainfall area covering the Ohio Valley, to the New Jersey coast over the Middle States on the 12th, where an extensive area of precipitation was developed in the Middle Atlantic States and portions of the east Gulf States. On the 13th it increased to decided intensity in New England, with a barometer reading of 29.40, heavy rains and northwest gales on the coast, and on the 14th it passed to the northeast, the storm clearing in New England, and disappeared from observation on the 15th.

VI.—On the 11th a feeble low appeared in Alberta behind the high that covered the Plateau, and moved to Lake Superior by the 13th, where it died out, having produced no noteworthy effects.

VII.—On the afternoon of the 15th a low area formed north of Montana, which moved to the Gulf of St. Lawrence in the northern circuit, reaching Winnipeg on the 15th, the middle St. Lawrence Valley on the 16th, the Gulf on the 17th, and Newfoundland on the 18th. Very little rain accompanied the course of this low, which was well defined, but not energetic throughout its course.

VIII.—On the 15th and 16th the observations indicated a feeble cyclonic disturbance to the southeast of the Florida Peninsula, the reading of the barometer at Jupiter being 29.88 on the morning of the 15th. About the same pressure continued on the 16th and 17th, but no indications of the central storm track are found.

IX.—This low passed from Alberta on the 16th, to the Gulf of St. Lawrence on the 20th, in the mean northern track, with well-defined isobars, and almost no rainfall throughout its course. Such instances as Nos. VII and IX show that precipitation is not necessary to the formation and advance of cyclonic gyrations of the air. On the other hand, it is to be noted that storms from the southwest appear to be greatly energized by accompanying heavy rainfalls, the winds in the latter case being more violent.

X.—This low area appeared in Alberta on the 19th and moved directly eastward to the Gulf of St. Lawrence on the 24th. The description of it would be like the preceding, and it is another instance of a storm in the northern circuit without important rainfall.

XI.—This was the only destructive hurricane that developed in the West India Islands during the month of October. On the 19th the barometer reading at Santiago de Cuba was 29.84, the winds there and in Florida showed that the disturbance was central south or southeast of Cuba. On the 20th it was still south of Cuba, but moving due north, as nearly as could be determined. On the night of the 20th it crossed Cuba, and on the 21st was between Cuba and Nassau, the pressure being 29.74 at Habana and 29.84 at Nassau in the morning, and 29.62 at Key West in the evening. The pressure fall was well marked over Florida, and by the 22d the center was between Nassau and the mainland. Reports from the office of the colonial secretary, Nassau, Bahamas, shows that the center passed over Hope Town, Green Turtle Cay, Cherokee Sound, Abaco Island, Golden Grove, Grand Bahama Island, and Bemini on the morning of the 22d causing much destruction to crops and the wreck of the *Mary C. Decker* near Winding Bay, Cherokee Sound, at 4 o'clock in the morning. The storm passed near Bermuda on the morning of the 24th, where the barometer reading of 29.16 was reported. Wind velocities of 55 miles an hour were reported from Jupiter and Key West, and 80 miles at Habana, and exceptionally high tides occurred on the south Atlantic coast. Suitable warnings were distributed by the Weather Bureau, hurricane signals being displayed on the south Atlantic coast as far north as Charleston, in consequence of which 120 vessels of various sizes, from fishing smacks to ocean steamers, including 2 U. S. Revenue steamers, valued, with their cargoes, at upwards of a million dollars, remained in port, Twelve seagoing vessels were detained in port at Nassau, New Providence, by this warning which was telegraphed to the authorities there by the Weather Bureau observer at Jupiter.

XII.—This was a very feeble depression, forming on the 23d in Alberta and moving directly eastward to the Gulf of St. Lawrence by the 26th, practically without precipitation and with slight changes in the temperature.

XIII.—This area formed also in Alberta on the 24th, moved east in the northern circuit to Lake Superior on the 26th, where slight showers occurred on the western side; on the 27th rain fell throughout the Lake Region and the Ohio Valley, the low being central near Lake Huron; on the 28th the

rain area and the storm advanced to New England, and on the 29th it had dissipated.

XIV.—On the 30th and 31st a feeble low formed on the west Gulf Coast, but it caused considerable rain in Texas and Louisiana on the 30th, and also in the Gulf States generally during the 31st.

XV.—On the morning of the 31st a low was formed over the Lakes, at the northern end of the trough, corresponding to which XIV was at the southern extremity. In the evening a well-marked low was central over New Jersey; this may have been a new configuration resulting from the collapse of the trough, which rapidly filled during the day. The rain area was very general east of the Mississippi River during the 31st.

LOCAL STORMS.

By A. J. HENRY, Chief of Division of Records and Meteorological Data.

There was a notable absence of local storms and destructive winds over the greater portion of the United States. Not since 1886 have so few storms, either general or local, been reported. The record is as follows:

On the 10th a heavy southwest wind prevailed over Lake Michigan, injuring cargoes and wrecking 2 or 3 schooners.

Heavy rains and dangerous gales occurred on the night of the 13th throughout southeastern New England. At Boston, 3.22 inches of rain was reported and shipping in the harbor was injured, but no serious disaster resulted. At Providence, R. I., a large unfinished school building was wrecked. At Portsmouth, N. H., the storm was severe; cellars were flooded and electric wires torn down.

TEMPERATURE OF THE AIR.

[In degrees Fahrenheit.]

The mean temperature is given for each station in Table II, for voluntary observers. Both the mean temperatures and the departures from the normal are given in Table I for the regular stations of the Weather Bureau.

The *monthly mean temperature* published in Table I, for the regular stations of the Weather Bureau, is the simple mean of all the daily maxima and minima; for voluntary stations a variety of methods of computation is necessarily allowed, as shown by the notes appended to Table II.

The *regular diurnal period* in temperature is shown by the hourly means given in Table IV for 29 stations selected out of 82 that maintain continuous thermograph records.

The *distribution* of the monthly mean temperature of the air over the United States and Canada is shown by the dotted isotherms on Chart II; the lines are drawn over the high irregular surface of the Rocky Mountain Plateau, although the temperatures have not been reduced to sea level, and the isotherms, therefore, relate to the average surface of the country occupied by our observers; such isotherms are controlled largely by the local topography, and should be drawn and studied in connection with a contour map.

The highest mean temperatures were: Key West, 78.6; Yuma, 75.5; Jupiter, 75.8. The lowest mean temperatures were: In Canada—White River, 30.0; Minnedosa, 33.7; and Qu 'Appelle, 33.8: In the United States—St. Vincent, 39.0; Sault Ste. Marie, 39.6; and Northfield, 39.2.

As compared with the normal for October, the mean temperature for the current month was deficient everywhere east of the Rocky Mountains, but in excess over the Plateau Region.

The greatest excesses were: Red Bluff, 4.0; Calgary and Spokane, 3.2; Salt Lake City, 3.1; Baker City, Sacramento, and Yuma, 3.0. The greatest deficits were: Detroit, 6.9; Erie, 6.5; Louisville, 6.2; Sandusky and Toledo, 6.1.

Considered by districts, the current departures from normal temperatures are as given in Table 1. The greatest positive departures were: Middle Plateau, 2.0; northern Plateau, 2.5. The greatest negative departures were: Lower Lake, 5.7; Ohio Valley and Tennessee, 5.1; Abilene (southern Slope), 4.6.

The years of highest and lowest mean temperatures for October are shown in Table I of the REVIEW for October, 1894. The mean temperature for the current month was not the highest on record at any regular station of the Weather Bureau. It was the lowest on record at Port Huron, 44.0; Detroit, 45.4; Erie, 45.8; Cleveland, 46.7; Sandusky, 47.2; Springfield, Ill., 49.5; Toledo, 46.2; Chicago, 46.2; Green Bay, 42.4; Davenport, 47.4; Des Moines, 48.2; Columbus, 48.2; Cincinnati, 51.2; Indianapolis, 49.4; Louisville, 53.1; Kansas City, 53.2; Springfield, Mo., 53.0; Fort Smith, 56.8; Little Rock, 58.6; Abilene, 60.6; Louisville, 53.1; Lynchburg, 53.5.

The *maximum and minimum temperatures* of the current month are given in Table I. The highest maxima were: 99, Yuma (2d); 95, Fresno (1st); 94, Red Bluff (14th). The lowest maxima were: 65, Block Island (8th), Pysht (18th), Port Angeles (20th); 66, Nantucket (frequently), Wood's Hole (3d), Alpena (2d). The highest minima were: 70, Key West (22d); 64, Jupiter (23d); 63, Port Eades (frequently). The lowest minima were: —3, Williston (29th); —2, Bismarck (29th); 3, Moorhead and Huron (29th); 4, Pierre (29th).

The years of highest maximum and lowest minimum temperatures are given in the last four columns of Table I of the current REVIEW. During the present month the maximum temperatures were the highest on record at: Columbia, 92; Corpus Christi, 90; Astoria, 76; Fort Canby, 83; Tatoosh Island, 72; Port Angeles, 65. The minimum temperatures were the lowest on record at: Sault Ste. Marie, 18; Port Huron, 19; Erie, 23; Indianapolis, 22; Columbus, 20; Parkersburg, 20; Lexington, 23; Louisville, 26; Keokuk, 20; Kansas City, 26; Wichita, 29; Concordia, 20; Pueblo, 19; Lander, 10; Rapid City, 10; Pierre, 4; Huron and Moorhead, 3; Bismarck, —2; Williston, —3; Portland, Oreg., 31; Carson City, 20.

The greatest daily range of temperature and the extreme monthly ranges are given for each of the regular Weather Bureau stations in Table 1, which also gives data from which may be computed the extreme monthly ranges for each station. The largest values of the greatest daily ranges were: Huron, 55; Bismarck, 54; Havre, 52; Rapid City, North Platte, and Columbia, Mo., 50. The smallest values were: Key West, 13; Jupiter, 15; Galveston and Port Eads, 17; Hatteras and Nantucket, 18. Among the extreme monthly ranges the largest values were: Bismarck, 86; Williston and Pierre, 83; Huron and Moorhead, 78; Rapid City, 75; St. Vincent, 70. The smallest values were: Key West, 17; Port Eads, 19; Jupiter, 21; Titusville, 28; Tampa, Hatteras, Block Island, and Nantucket, 29.

The *accumulated monthly departures* from normal temperatures from January 1 to the end of the current month are given in the second column of the following table, and the average departures are given in the third column, for comparison with the departures of current conditions of vegetation from the normal conditions.

Districts.	Accumulated departures.		Districts.	Accumulated departures.	
	Total.	Average.		Total.	Average.
	°	°		°	°
New England	+ 0.1	0.0	Middle Atlantic	— 9.7	— 1.0
Upper Lake	+ 0.5	0.0	South Atlantic	—16.2	— 1.6
North Dakota	+ 5.0	+ 0.5	Florida Peninsula	—13.8	— 1.4
Missouri Valley	+ 3.1	+ 0.3	East Gulf	—17.4	— 1.7
Northern Plateau	+ 3.5	+ 0.4	West Gulf	—17.5	— 1.8
			Ohio Valley and Tenn.	—13.1	— 1.3
			Lower Lake	— 7.2	— 0.7
			Upper Mississippi	— 0.9	— 0.1
			Northern Slope	— 9.8	— 1.0
			Middle Slope	— 4.6	— 0.5
			Abilene (southern Slope)	—18.3	— 1.8
			Southern Plateau	— 6.3	— 0.6
			Middle Plateau	—10.1	— 1.0
			North Pacific	— 2.2	— 0.2
			Middle Pacific	— 6.0	— 0.6
			South Pacific	— 7.9	— 0.8

The *limit of freezing weather* is shown on Chart VI by the isotherm of minimum 32°, and the limit of frost by the isotherm of minimum 40°.

MOISTURE.

The *quantity of moisture* in the atmosphere at any time may be expressed by means of the weight contained in a cubic foot of air, or by the tension or pressure of the vapor, or by the temperature of the dew-point. The mean dew-points for each station of the Weather Bureau, as deduced from observations made at 8 a. m. and 8 p. m., daily, are given in Table I.

The *rate of evaporation* from a special surface of water on muslin at any moment determines the temperature of the wet-bulb thermometer, but a properly constructed evaporometer may be made to give the *quantity* of water evaporated from a similar surface during any interval of time. Such an evaporometer, therefore, would sum up or integrate the effect of those influences that determine the temperature as given by the wet bulb; from this quantity the *average humidity of the air* during any given interval of time may be deduced.

Sensible temperatures.—The sensation of temperature experienced by the human body and ordinarily attributed to the condition of the atmosphere depends not merely on the temperature of the air, but also on its dryness, on the velocity of the wind, and on the suddenness of atmospheric changes, all combined with the physiological condition of the observer. The condition of the atmosphere as to moisture is so important that it has, by exaggeration, been sometimes considered as a controlling feature and the temperature of the wet-bulb thermometer, when whirled in the shade, has been called the sensible temperature, although this is often but a partial index of the sensation of temperature. In order to present a monthly summary of the atmospheric conditions on which hygienic and physiological phenomena depend, the moisture must be fully considered, and therefore Table VIII has been prepared, showing the maximum, minimum, and mean readings of the wet-bulb thermometer at 8 a. m. and 8 p. m., seventy-fifth meridian time. A complete expression for the relation between atmospheric conditions and nervous sensations is under consideration, but has not yet been obtained.

PRECIPITATION.

[In inches and hundredths.]

The *distribution of precipitation* for the current month, as determined by reports from about 2,500 stations, is exhibited on Chart III. The numerical details are given in Tables I, II, and III.

The precipitation for the current month was heaviest, 20.00 to 24.00, on the southeast coast of the Florida Peninsula; but least, namely, between 0.00 and 0.5, over all the region, with a few local exceptions, between the Lake Region and the Ohio Valley, westward to Wyoming and Montana, and thence throughout the Rocky Mountain Plateau and Pacific Coast regions.

The *diurnal variation* is shown by Table XII, which gives the total precipitation for each hour of seventy-fifth meridian time, as deduced from self-registering gauges kept at about 43 regular stations of the Weather Bureau; of these 37 are float gauges and 6 are weighing gauges.

The *normal precipitation* for each month is shown in the Atlas of Bulletin C, entitled "Rainfall and Snow of the United States, compiled to the end of 1891, with annual, seasonal, monthly, and other charts."

The *current departures* from the normal precipitation are given in Table I, which shows that there was an excess in the Florida Peninsula, but a deficiency everywhere else, a few localities only excepted. Large excesses were: Jupiter, 15.9; Meridian, 1.9; Pueblo and Abilene, 1.1. The large deficits were: Tatoosh Island, 7.9; Neah Bay. 11.0; Astoria, 6.4; Fort Canby and Jacksonville, 5.1; Charleston and Hatteras, 3.6; Eastport, 3.5.

The average departure for each district is also given in Table I. By dividing these by the respective normals the following corresponding percentages are obtained (precipitation is in excess when the percentages of the normals exceed 100):

Above the normal: South Atlantic, 178; Abilene (southern Slope), 136; southern Plateau, 112.

Below the normal: New England, 69; Middle Atlantic, 73; South Atlantic, 36; east Gulf, 72; west Gulf, 64; Ohio Valley and Tennesse, 43; lower Lake, 54; upper Lake, 33; North Dakota, 22; upper Mississippi, 14; Missouri Valley, 12; northern Slope, 62; middle Slope, 78; middle Plateau, 40; northern Plateau, 1; north Pacific, 8; middle Pacific, 8; southern Pacific, 35.

The years of greatest and least precipitation for October are given in the REVIEW for October, 1894. The precipitation for the current month was the greatest on record only at Jupiter, 21.03. It was the least on record at: Eastport, 1.15; Northfield, 0.45; Port Huron, 0.85; Alpena, 0.77; Grand Haven, 0.43; Duluth, 0.09; Pierre, trace; Rapid City, 0.02; Omaha, 0.07; Kansas City, 0.12; St. Louis, 0.23; Salt Lake City, 0.24; Eureka, 0.05; Roseburg, 0.00; Portland, Oreg., trace; Astoria, 0 23; Fort Canby, 0.31; Tatoosh Island, 1.32; Neah Bay, 1.27; Port Angeles, 0.15; Spokane, trace; Walla Walla, 0.00.

The *total accumulated monthly departures* from normal precipitation from January 1 to the end of the current month are given in the second column of the following table; the third column gives the ratio of the current accumulated precipitation to its normal value.

Districts.	Accumulated departures.	Accumulated precipitation.	Districts.	Accumulated departures.	Accumulated precipitation.
	Inches.	*Per ct.*		*Inches.*	*Per ct.*
Florida Peninsula	+ 0.50	101	New England	— 6.60	82
Abilene (southern Slope)	+ 6.10	125	Middle Atlantic	— 8.40	78
Southern Plateau	+ 0.50	106	South Atlantic	— 5.40	89
			East Gulf	— 5.10	90
			West Gulf	— 6.60	83
			Ohio Valley and Tenn.	—11.40	71
			Lower Lakes	— 8.60	70
			Upper Lakes	— 8.40	71
			North Dakota	— 1.90	89
			Upper Mississippi	— 9.00	71
			Missouri Valley	— 5.20	82
			Northern Slope	— 0.70	95
			Middle Slope	— 1.60	92
			Middle Plateau	— 1.60	83
			Northern Plateau	— 4.10	70
			North Pacific	— 7.60	83
			Middle Pacific	— 2.60	88
			South Pacific	— 2.80	78

The total snowfall at each station is given in Table II. Its geographical distribution is given on Chart No. VI of "Total monthly snowfall." The isotherms of minimum 32° and 40° are also shown on this chart.

HAIL.

The following are the dates on which hail fell at one or more stations in the respective States:

Arizona, 3, 4, 27. California, 15, 16, 20. Illinois, 11. Indian Territory, 27. Iowa, 11. Kansas, 22, 26. Kentucky, 11, 27. Maine, 28. Massachusetts, 17. Michigan, 8. Missouri, 24, 26. Nevada, 15, 19, 20. New York, 9, 17. Ohio, 9, 11, 15, 27. Oklahoma, 27. Utah, 3, 19, 22. West Virginia, 31.

SLEET.

The following are the dates on which sleet fell at one or more stations in the respective States:

Arkansas, 30. California, 21. Colorado, 22. Georgia, 30. Illinois, 24, 31. Indiana, 31. Iowa, 11. Kansas, 22, 30. Mary-

land and Massachusetts, 31. Michigan, 7, 8, 14, 16, 18, 19, 20, 25, 29. Minnesota, 14. Missouri, 22, 23, 24, 29, 30. Montana, 13. Nebraska, 1, 30. New Hampshire, 17. New York, 8, 15, 16, 17, 19, 20, 23, 28, 29, 31. Ohio, 1, 8, 9, 19, 20, 31. Oklahoma, 23. Pennsylvania, 31. South Dakota, 10. Utah, 4, 21. Vermont, 9, 17. Virginia, 31. Wisconsin, 12.

WIND.

The *prevailing winds* for October, 1895, viz, those that were recorded most frequently, are shown in Table I for the regular Weather Bureau stations.

The *resultant winds*, as deduced from the personal observations made at 8 a. m. and 8 p. m., are given in Table IX. These latter resultants are also shown graphically on Chart II, where the small figure attached to each arrow shows the number of hours that this resultant prevailed, on the assumption that each of the morning and evening observations represents one hour's duration of a uniform wind of average velocity. These figures indicate the relative extent to which winds from different directions counterbalanced each other.

HIGH WINDS.

Maximum wind velocities of 50 miles or more per hour were reported at regular stations of the Weather Bureau as follows (maximum velocities are averages for five minutes; extreme velocities are gusts of shorter duration, and are not given in this table):

Stations.	Date.	Velocity.	Direction.	Stations.	Date.	Velocity.	Direction.
		Miles				*Miles*	
Buffalo, N. Y	19	54	w.	Cleveland, Ohio	19	50	sw.
Do	28	50	w.	Jupiter, Fla	23	55	ne.
Chicago, Ill	10	52	s.	Kittyhawk, N. C	4	52	ne.
Do	18	56	sw.	Williston, N. Dak	18	50	nw.

SUNSHINE AND CLOUDINESS.

The quantity of sunshine, and therefore of heat, received by the atmosphere as a whole is very nearly constant from year to year, but the proportion received by the surface of the earth depends largely upon the absorption by the atmosphere, and varies with the distribution of cloudiness. The sunshine is now recorded automatically at 15 regular stations of the Weather Bureau by its photographic, and at 22 by its thermal effects. At one station records are kept by both methods. The photographic record sheets show the apparent solar time, but the thermometric sheets show seventy-fifth meridian time; for convenience the results are all given in Table XI for each hour of mean local time.

Photographic and thermometric registers give the duration of that intensity of sunshine which suffices to make a record, and, therefore, they generally fail to record for a short time after sunrise and before sunset, because, even in a cloudless sky, the solar rays are then too feeble to affect the self-registers. If, therefore, such records are to be used for determining the amount of cloudiness, they must be supplemented by special observations of the sky near the sun at these times. The duration of clear sky thus specially determined constitutes the so-called twilight correction (more properly a low-sun correction), and when this has been applied, as has been done in preparing Table XI, there results a complete record of clear sky from sunrise to sunset in the neighborhood of the sun. The twilight correction would not be needed if the self-registers were used for ascertaining the duration of a special intensity of sunshine, but is necessary if the duration of cloudiness is alone desired, as is usually the case.

The cloudiness is determined by numerous personal observations at all stations during the daytime, and is given in the column of "average cloudiness" in Table I; its complement, or percentage of clear sky, is given in the last column of Table XI.

COMPARISON OF DURATIONS AND AREAS.

The sunshine registers give the *duration* of direct sunshine whence the percentage of possible sunshine is derived; the observer's personal estimates give the percentage of *area* of clear sky. It should not be assumed that these numbers should agree, and for comparative purposes they have been brought together, side by side, in the following table, from which it appears that, in general, the instrumental record of percentages of duration of sunshine is almost always larger than the observers' personal estimate of percentages of area of clear sky; the average excess for October, 1895, is 6 per cent for photographic records, and 10 per cent for thermometric records. The details are shown in the following table:

Difference between instrumental and personal observations of sunshine.

Photographic stations.	Instrumental.	Personal.	Difference.	Thermometric stations.	Instrumental.	Personal.	Difference.
Phœnix, Ariz	88	71	17	Cincinnati, Ohio	84	70	14
Denver, Colo	83	64	19	Des Moines, Iowa	83	71	12
Santa Fe, N. Mex	80	68	12	New Orleans, La	80	80	0
Washington, D. C	79	84	— 5	Vicksburg, Miss	80	78	2
Dodge City, Kans	77	70	7	St. Louis, Mo	79	70	9
Helena, Mont	77	62	15	Atlanta, Ga	78	74	4
Salt Lake City, Utah	77	61	16	Louisville, Ky	78	74	4
Kansas City, Mo	76	72	4	Chicago, Ill	77	65	12
Savannah, Ga	76	69	7	Philadelphia, Pa	76	69	7
Galveston, Tex	75	74	1	Little Rock, Ark	75	65	10
Bismarck, N. Dak	71	58	13	Wilmington, N. C	73	73	0
Portland, Oreg. †	66	56	10	Baltimore, Md	72	76	— 4
San Diego, Cal	65	56	9	New York, N. Y	70	64	6
Cleveland, Ohio	61	54	7	Detroit, Mich	67	57	10
Eastport, Me	52	36	16	San Francisco, Cal	64	62	2
				Portland, Oreg. †	62	56	6
				Boston, Mass	61	54	7
				Rochester, N. Y	60	52	8
				Columbus, Ohio	56	47	9
				Portland, Me	52	44	8
				Buffalo, N. Y	38	35	3
				Marquette, Mich	31	21	10

* No thermometric report. † Records kept by both methods.

ATMOSPHERIC ELECTRICITY.

Numerical statistics relative to auroras and thunderstorms are given in Table X, which shows the number of stations from which meteorological reports were received, and the number of such stations reporting thunderstorms (T) and auroras (A) in each State and on each day of the month, respectively.

The dates on which reports of thunderstorms for the whole country were most numerous were: 11th, 24; 15th, 27; 26th, 26; 27th, 59.

Thunderstorm reports were most numerous in: California, 44; Colorado, 23; Missouri, 22; Nevada, 27; Ohio, 36.

Thunderstorms were most frequent in: California, 10 days; Colorado, 9; Texas, 8.

Auroras.—The evenings on which bright moonlight must have interfered with observations of faint auroras are assumed to be the four preceding and following the date of full moon, viz, from the 1st to the 7th, inclusive, and also the 28th, 29th, 30th, and 31st. On the remaining twenty days of this month 574 reports were received, or an average of about twenty-nine per day. The dates on which the number of reports especially exceeded the average were: 12th, 215; 15th, 132; and 16th, 52.

Auroras were reported by a large percentage of observers in: Minnesota, 119; Wisconsin, 103; and Iowa, 57.

Auroras were reported most frequently in: North Dakota, 16 days; Minnesota, 15; Montana, 13; and Wisconsin, 10.

CANADIAN DATA—THUNDERSTORMS AND AURORAS.

Auroras were reported as follows: 1st, Quebec and Port Arthur. 4th, Quebec and Winnipeg. 6th, Father Point, Quebec, and Edmonton. 8th, Winnipeg and Battleford. 10th, Quebec. 11th, Minnedosa and Battleford. 12th, Charlottetown, Rockliffe, Toronto, White River, Kingston, Port Stanley, Saugeen, Parry Sound, Winnipeg, Qu'Appelle, and Prince Albert. 13th, Toronto, Port Stanley, Port Arthur, Edmonton, and Battleford. 14th, Grand Manan, Father Point, Quebec, Montreal, Port Arthur, and Esquimault. 15th, Father Point, Quebec, Rockliffe, and Winnipeg. 16th, Winnipeg, Minnedosa, and Prince Albert. 17th, Port Arthur, Minnedosa, Qu'Appelle, Prince Albert, and Battleford. 18th, Father Point, Quebec, and Kingston. 21st, Father Point. 23d, Minnedosa and Medicine Hat. 25th, Winnipeg. 26th, Rockliffe. 27th, Edmonton. 28th, Quebec. 29th, Sydney and Swift Current.

Thunderstorms were reported as follows: 3d, Hamilton and Bermuda. 8th, Esquimault. 23d, Bermuda. 25th, Grand Manan. 26th, Charlottetown. 27th, Port Stanley. 28th, Halifax, Grand Manan, and Yarmouth.

INLAND NAVIGATION.

The *extreme and average stages of water* in the rivers during the current month are given in Table VII, from which it appears that no river has attained the danger point and that almost, without exception, the stages of water have been remarkably low. The lowest waters reported, as referred to the low water mark that is ordinarily adopted as the zero of the gauge, was at Vicksburg, where the Mississippi reached 5 feet below zero at the close of the month. In general there was a steady decline throughout the month in all the rivers tributary to the Mississippi.

Ice in rivers.—The Red River of the North was frozen so that navigation closed on the 29th, the earliest date on record.

METEOROLOGY AND MAGNETISM.

By Prof FRANK H. BIGELOW.

An attempt was made, during the year October 1, 1894, to September 31, 1895, to exhibit the synchronous variations of the magnetic and the meteorological elements, using the horizontal component of the magnetic force alone, and with the least possible labor of computation. During the year beginning with October 1, 1895, the same comparison will be continued, but the total deflecting magnetic forces will be computed, employing the data supplied by the observatories at Washington and Toronto which is all that is available. At least five observatories, at quite widely separated stations, would be necessary in order to give a correct mean value of the impressed deflecting field, and to eliminate the terms due to the local conditions of the earth, the atmosphere and the instruments. In must be steadily borne in mind that we are not to expect a perfectly harmonious system of fluctuating curves, because if that were the case either the magnetic forces would be the only ones determining the pressure and the temperature changes in the atmosphere, or else the magnetic variations would be the direct product of antecedent temperature changes. This latter supposition is excluded by the facts (1) that the temperatures of the northwest, as employed, are observed 2,000 miles away from the instruments, and are not synchronous with local variation in the free atmosphere, and (2) that the magnetic observations are made in rooms maintained at a very uniform temperature. The former supposition is also untenable, because in that case the equatorial radiation from the sun and the convectional system of atmospheric currents, which are the chief meteorological phenomena, would have to be ignored. It is therefore evident that the actual temperatures and pressures of the northwest, and to a subordinate degree those occurring in other districts, are mixed products of the equatorial and the polar fields of force that extend to the earth from the sun. The immediate problems in the physics of the atmosphere are to learn (1) the methods of the transformation of these two kinds of solar energy, and (2) the proportional parts of each that ultimately appear in the so-called highs and lows of the air. Neither of these are easy to solve with our present limited knowledge, but it is hoped that before long some definite contribution may be communicated, as deduced from the data in hand. Meanwhile it will be of profit to publish the accessible data in convenient form for study by those who are disposed to investigate these subjects, and without comment on the meaning to be drawn from the same.

In Bulletin No. 2, U. S. Weather Bureau, 1892, Notes on a New Method for the Discussion of Magnetic Observations, the adopted form of computation was explained, and experience in its use has confirmed the first favorable impression as to its simplicity and fruitfulness. Since it is not possible to reproduce in the WEATHER REVIEW each step in the computation, the following account of the details may be profitable:

First. The values of the horizontal force H, the declination D, the vertical force V, for Washington and Toronto, are written down and the means taken. These appear as H, D, V in the table on Chart V.

Second. In order to eliminate the slow change in the magnetic elements which is constantly going on at each station as a part of the secular variation, the mean values of H, D, V for the first fifteen days of the month, also for the last fifteen days of the month, are taken, and assumed to be the true values for the 8th and 24th days, respectively. Then the variation in two weeks shown by these values, assumed to have held good for the whole month, is distributed proportionally to the time throughout the month, forming a set of numbers which are the simplest available means for the several days, as a system of reference points. This is preferred to the means arbitrarily selected called "quiet" days. The difference between the given values H, D, V and the computed $H_\circ$ $D_\circ$ $V_\circ$ gives the residuals ΔH, ΔD, ΔV, which are not exhibited. For such stations, however, as report their results in C. G. S. units, $\Delta H = dx$, $\Delta D \tan H_\circ = dy$, $\Delta V = dz$. The transference from ΔD to dy can be done very quickly, by constructing a simple auxiliary table in which for these stations $10' = 0.00050$ C. G. S., second differences being of no importance. The units are the 5th decimal dyne, C. G. S. system.

Third. $$\sigma = \sqrt{dx^2 + dy^2}; \quad s = \sqrt{dx^2 + dy^2 + dz^2};$$

$$\tan \beta = \frac{dy}{dx}; \qquad \tan \alpha = \frac{dz}{\sigma};$$

Practically a diagram scale is used in which one entry with dx and dy, gives σ and β, and a second entry with σ and dz, gives s and α, where s is the total deflecting vector, σ its horizontal component, α the altitude from the plane of the horizon, and β the azimuth in the horizon from the magnetic north point of the station through the west, thus following the usual convention of counting westerly declination angle as positive. I have preferred to use station magnetic instead of geographical meridians, on account of simplicity of computation and directness of interpretation of the magnetic phenomena.

Fourth. The pressures and temperatures are treated in the same way as H, D, V, and the ΔP and ΔT are derived by subtraction from the values computed from the means of the first and last halves of the month.

Fifth. The lines in the diagrams represent the changes in the horizontal component σ, the total vector s, the pressure inverted, and the temperature. A study of the angles α and β will disclose the parts of space from which the deflecting forces approach the station of observation.

CLIMATE AND CROP SERVICE.

By JAMES BERRY, Chief of Climate and Crop Service Division.

The following extracts describing the general climatic conditions in the several States and Territories are taken from the monthly reports of the respective services.

Snowfall and rainfall are expressed in inches.

Alabama.—The month was one of the best experienced in years for harvesting; there was hardly a day on which rain interfered with cotton picking. The only damaging weather conditions were cold and frosts, on a few scattered dates, which were too late to do serious injury. The mean temperature was 60.4°, or 4.4° less than normal. The highest temperature, 99°, occurred at Alco and Brewton on the 6th, and at Healing Springs on the 7th, and the lowest, 27°, at Jasper on the 21st. The prevailing warmest days were the 5th, 6th, and 7th; and the coldest the 21st and 22d. The average precipitation was 2.08, or 0.39 less than normal. The greatest rainfall occurred on the 31st, when there was an average of 0.60 over the entire State. The greatest monthly precipitation, 4.35, was at Jasper, and the least, 0.06, at Thomasville. Frosts occurred on the 1st, 2d, 3d, 4th, 9th, 10th, 20th, 21st, 22d, and 29th.

Arizona.—The mean temperature was 66.6°, or 1.5° above the normal. The highest temperature, 108°, was reported from Fort Mojave and the lowest, 21°, from Flagstaff. The average precipitation was 1.04, or 0.95 in excess of the normal. The greatest amount, 4.68, was recorded at Pinal Ranch, and 0.00 was reported from Flagstaff, Texas Hill, and Parker. Frosts occurred on the 5th, 6th, 11th, 13th, 21st, 22d, 23d, 25th, 26th, 28th, 29th, and 30th.

Arkansas.—The mean temperature was 56.6°, or 4.7° below the normal. The highest temperature reported, 96°, occurred at Helena on the 6th, and the lowest, 21°, at Keesees Ferry on the 29th. The average precipitation, 1.44, is 0.78 below the normal. The greatest amount recorded, 2.91, occurred at Texarkana, and the least, 0.37, at Gaines Landing. Frosts occurred on the 2d, 9th, 10th, 20th, 21st, and 28th.

California.—The mean temperature was 61.5°, only 0.4° above the normal. The highest temperature, 108°, was recorded at Indio, Salton, and Volcano Springs, and the lowest, 6°, at Bodie, in the mountains. The average precipitation was 0.28, or 0.94 below the normal. The greatest monthly amount, 1.59, was recorded at Los Gatos, and the least, 0.00, at a number of places. Frosts occurred at one or more places on every day of the month.

Colorado.—It was cooler than usual over the eastern border counties, the Arkansas Valley, the Divide, Boulder and Routt counties; elsewhere the temperature was generally above the normal, the greatest excess occurred over the mountain districts and the valley of the Rio Grande. The highest temperatures were generally recorded on the 1st and 2d, and the lowest on the 27th and 31st. The average precipitation, 1.04, was 0.19 greather than the normal. Precipitation was general on the western slope on the 21st and 22d, and over the greater part of the State on the 3d, 4th, and 5th. The greatest monthly rainfall, 2.71, was reported from Gold Hill, while 0.00 was reported from Brush and Kirk. Few stations reported snow on the ground at the end of the month. Those reporting appreciable amounts were: Ruby, 5.00, and Gold Hill, 3.00.

Connecticut.—(See *New England.*)

Delaware.—(See *Maryland.*)

District of Columbia.—(See *Maryland.*)

Florida.—The month was characterized by excessive sunshine and a marked deficiency in moisture, the latter causing serious consequences to fall crops. The mean temperature was 78.6°, or 4.0° above the normal. The highest temperature, 92°, was recorded at Kissimmee on the 29th, and the lowest, 44°, at Milton on the 21st, 22d, and 23d. The average precipitation was 3.07, or 1.57 less than normal. The greatest monthly amount, 21.03, occurred at Jupiter, and the least, 0.40, at Lake City.

Georgia.—The month, as usual, was marked by extreme dryness, with clear and pleasant weather. There was a cool wave on the 9th and 10th, and again toward the end of the month. The mean temperature was 59.6°, or about 3° below the normal. The highest temperature, 82°, occurred on the 6th, and the lowest, 38°, on the 13th. The average precipitation was 1.20, or 1.52 less than normal. There were three periods of general rain, 7th and 8th, 11th and 12th, and 27th and 28th, and one period, 30th and 31st, when the rain was confined to the northern counties. Frosts were experienced at intervals at many points in the northern and central counties from the 10th.

Idaho.—The mean temperature was 48.6°. The highest daily temperature, 93°, was recorded at Idaho City on the 1st, and the lowest, 3°, at Chesterfield, on the 27th. The average precipitation was 0.07. The greatest amount, 0.41, was recorded at Swan Valley, and the least, 0.00, at 13 stations.

Illinois.—The month began with low temperatures and was uniformly cool, the mean temperature was 48.4°, or 5.4° below the normal; lower than any previous October record for the State. The highest temperature, 88°, was recorded at New Burnside on the 4th, and the lowest, 8°, at Lanark on the 30th, being the lowest ever before recorded in the State for October. There was a marked defiency in rainfall, the average amount was 0.62, or 2.22 less than the normal, and 0.41 below the lowest previous October record. The greatest monthly amount, 1.52, was recorded at Kankakee, and the least, 0.05, at Rose Hill.

Indiana.—The weather was cool and very dry. The daily mean temperature was above the normal on only a few days. The mean temperature was 47.9°, or 5.0° below the normal. The highest temperature, 84°, occurred at Marengo on the 7th, and the lowest, 10°, at Bluffton on the 30th, which is the lowest minimum recorded for October. Light local rains fell on only a few days. The average amount was 0.73, or 1.64 below the normal. The greatest amount for the month, 1.59, was recorded at Syracuse, and the least, 0.12, at Topeka. The continued drought was very distressing and did much injury to health and to the growing cereals. Rivers, streams, and creeks are very low and navigation on the Ohio River suspended; wells and cisterns dry and stock water scarce in many localities. Snow fell in small quantity in some localities in the northern portion on the 19–20th. Frost occurred on numerous dates.

Indian Territory.—(See *Oklahoma.*)

Iowa.—The month was abnormally cold and dry, with more than the average amount of sunshine and of bright, clear weather. The mean temperature was 46.0°, or 3.5° below the normal. The highest temperature, 88°, was recorded at Glenwood on the 2d, and the lowest, 0°, at Neola on the 29th. The average precipitation was 0.47, or 2.38 less than normal. The drought was severe on pastures, winter wheat, and rye. The greatest monthly precipitation, 1.38, was recorded at Iowa City, and the least, 0.00, at Decorah and Logan.

Kansas.—The mean temperature was 52.3°, or 3° below the normal. The highest daily temperature, 93°, was recorded at Oswego on the 12th, and the lowest, 11°, at Jaqua on the 28th. The average precipitation, 0.70, was 0.91 less than the normal. The greatest monthly amount, 2.15, was recorded at Macksville, and the least, 0.00, at Paola. Snow occurred on the 4th and 30th, and frost on numerous dates.

Kentucky.—The temperature preserved quite a remarkable uniformity throughout the month. Though the mean temperature was 52.2°, or 5° below the normal, there were no abrupt or marked fluctuations. Frosts, freezing temperatures, and the formation of ice were reported from every station. The highest temperature, 89°, was recorded at Sandy Hook on the 4th, and the lowest, 14°, at Pleasure Ridge Park on the 30th. Rainfall, in the form of light scattered showers, had no effect in allaying the drought. All streams and wells were lower than for many years, and the Ohio River was fordable at many points. The average amount of precipitation was only 1.24, or 1.43 less than normal.

Louisiana.—The mean temperature was 64.3°, or 2° below the normal; that for the northern section was 61.2°, or more than 3° below, and for the southern section, 66°, or a little more than 1° below. The highest temperature, 95°, was recorded at Liberty Hill on the 6th, and the lowest, 30°, at Davis, on the 10th. The average amount of precipitation was 2.82, or 0.65 more than normal; for northern Louisiana, 2.28, and for southern Louisiana, 2.16, or 0.50 and 0.70, respectively, more than the usual amount. There was an average of three days on which rain fell in the northern section, and four in the southern section, the prevailing dates being the 7th and 29th–31st. Southeastern Louisiana had less rain than usual, but from the southwest parishes northeastward to the Florida parishes, the rainfall was above the normal. The weather could not well have been surpassed for harvesting cotton and rice. Until the rains of the last days of the month not much farm work was done, owing to the drought. Frosts occurred in some localities on the 1st, 8–10th, 12th, 14th, 18th, 20th–22d, 25th, and 31st.

Maine.—(See *New England.*)

Maryland.—The mean temperature was 50.3°, or 4.4° below the normal. The highest temperature, 82°, occurred at Jewell on the 19th, and the lowest, 4°, at Deer Park on the 30th. The average amount of precipitation was 1.96, or 0.82 less than the normal amount. The greatest monthly rainfall, 3.59, was recorded at Mardela Springs, and the least, 0.44, at Great Falls. Snow to the amount of a trace was reported from Sunny Side, Oakland, Baltimore, Fallston, Md., and Wilmington, Del. Hail was reported at Westernport on the 31st.

Massachusetts.—(See *New England.*)

Michigan.—The mean temperature was 43.2°, or 5.7° below the normal. The temperature was below the normal on twenty-five days, and above on but six days, the 3d, 5th, 6th, 18th, 26th, and 27th. The highest temperature, 90°, was recorded at Benton Harbor on the 7th, and the lowest, 5°, at Boon on the 21st. Altogether this has been one of the coldest Octobers on record. The average precipitation was 0.96,

decidedly below the normal. The greatest deficiencies appear in the central and southern sections. The greatest monthly rainfall, 3.58, occurred at Sault Ste. Marie, and the least, 0.13, at Hesperia. The ground was bare of snow in all parts of the State on the 15th, but at the end of the month there remained on the ground over the Upper Peninsula, 2.3, over the northern counties, 1.1, and over the central and southern counties, only a trace in scattered localities. This has been one of the driest Octobers for many years; there is a general complaint that wells, creeks, and streams are very low, while the parched condition of the soil is bad for fall seeding.

Minnesota.—The mean temperature was 41.4°, or about 3° below the normal. The coldest periods were on the 8th and 9th, 19th, 20th, 22d, and from the 27th to the close of the month. The 26th was unusually warm; the rest of the month the temperature was about normal; the highest, 81°, was recorded at Moorhead on the 17th, and the lowest, 1° below zero, at Ada on the 29th. The average precipitation was 0.24, or 1.29 less than normal. The rain fell principally on the 14th, 26th, and 27th. The greatest amount, 0.90, occurred at Mazeppa and Tower, and the least, 0.00, at Glencoe. Owing to the drought the rivers, streams, and lakes were unusually dry.

Mississippi.—The weather conditions were mild and equable; no storms and no unusually cold or warm periods. The mean temperature was 60.5°, or about 5° below normal. The highest temperature, 88°, was recorded at Vaiden on the 6th, and the lowest, 26°, at French Camp on the 21st. The average precipitation was 2.25, or 0.57 less than normal. The greatest amount, 7.30, occurred at Moss Point, and the least, 0.20, at Hernando. Rain fell within the State on fifteen days, but was most general on the 7th and 8th and from the 27th to the close of the month. The previous deficiency in precipitation continued and caused very low stages in all the water courses. Frosts occurred on the 1st, 3d, 9th, 10th, 11th, 13th to 24th, and 28th. The southern limit of frost was at Crystal Springs on the 21st. Ice formed at Yazoo City on the 21st and at Pontotoc on the 28th.

Missouri.—The month was unusually cold, with an average deficiency in temperature of from 3.5° to 4.5° in the central and northern sections and 5.0° to 6.0° in the southern section. The mean temperature, 51.0°, was 4.7° below the normal. The highest temperature, 89°, was recorded at Willow Springs on the 16th, and the lowest, 15°, at Unionville on the 29th. The average precipitation was 0.35, or 2.22 less than normal. The greatest amount, 1.56, occurred at Mineral Spring, and the least, 0.00, at Bagnell. This has been one of the driest Octobers for many years. Although the month was especially favorable for gathering the immense corn crop, the drought was very severe on wheat and grasses; in some sections the ground was too dry for seeding, and stock water was reported scarce in nearly all localities at the close of the month. A trace of snow fell at a few stations in the central and western sections.

Montana.—The mean temperature was 46°, or about 2° above the normal. The highest temperature was 90°, at Great Falls on the 5th and Wibaux on the 12th, and the lowest, 0°, at Poplar and Wibaux on the 29th. The average precipitation was 0.34, or 0.50 less than the normal. The greatest amount, 1.70, occurred at Kipp, and the least, "trace," at several stations. Most of the precipitation was in the form of rain, very little snow having fallen.

Nebraska.—The month was cool and dry, giving the lowest temperature and the smallest precipitation yet recorded in the State for October. The mean temperature was 48.1°, or 2° below the normal. The highest temperature, 91°, was recorded at Holdrege on the 5th, and the lowest, 1°, at Lynch and Springview on the 29th. The average precipitation was 0.22, or 1.26 below the normal. The largest amount at any station, 1.20, occurred at Franklin, and the least, 0.00, at several stations.

Nevada.—The mean temperature was 49.9°, or 0.6° above the normal. The localities having more sunshine than usual were the northern portions of Washoe, Humboldt, and Elko, and the western and southern portions of Douglas and Esmeraldo counties. The greatest excess was 10°, at Tuscarora, and the greatest deficiency, 11°, at Wadsworth. The mean temperature steadily, and almost imperceptibly, decreased day by day, the highest, with scarcely an exception, being recorded on the 1st, and the lowest on the 31st. St. Thomas, with a maximum of 100° on the 1st and other dates, registered one extreme, and Carlin, with a minimum of 5° below zero on the 31st, the other. The average precipitation was 0.26, or 0.15 less than the usual amount. The greatest deficiency, 0.95, was recorded at Verdi, and the least, 0.01, at Hot Springs and Hawthorne. The greatest excess, 0.97, was at Sunnyside, and the least, 0.29, at Belmont. The largest amount of precipitation for any station, 1.33, was recorded at Sunnyside, and the smallest, 0.00, at five stations. The snowfall was extremely light, Hamilton reporting a "trace" and Osceola 4.00. Windstorms, with (estimated) velocities of 25 miles or more, occurred at Winnemucca on the 5th and 16th; Verdi on the 6th, 7th, 8th; San Antonio on the 14th, 15th, and 16th, and at Austin and Carson City on the 15th.

New England.—The mean temperature was 49.7°, or 3.2° below the normal. The month has been generally cool and fair, with no extreme cold and no long spells of either mild or cold weather; the coldest was on the 22d and 31st, when most observers recorded their minimum temperature. The average precipitation was 6.10, or 2.13 more than the usual amount. At New Haven, Conn., Woods Hole, Mass., and all the northern stations there was a deficiency in rainfall, but in eastern and central districts, where the great rain of the 12–14th came, and also the fall on the last night of the month, there was a marked excess. The observer at Framingham, Mass., reports 6.66 more than the usual amount of precipitation. The difference in the rainfall in the southern and northern parts of New England was seldom greater than was shown this month, viz: 10.00 and 11.00 in eastern Massachusetts, and only 0.23 at Burlington, Vt. A "trace" of snow fell over most of New England on the 21st and 22d, and also on the 31st. In northern sections the ground was well covered.

New Hampshire.—(See *New England.*)

New Jersey.—The mean temperature was 49.9°, or 4.5° below the normal. The warmest days were 2d, 3d, 4th, 5th, 6th, 7th, 18th, 27th, and 28th, when the maxima ranged from 66° to 83°. The coldest days were the 10th, 11th, 21st, 22d, 24th, 25th, 26th, 29th, 30th, and 31st, when minima ranging from 18° to 35° were recorded. The average precipitation was 3.60, or 0.19 more than the normal. Precipitation was quite general on the 7th, 8th, 12th, 13th, and 31st, and in the northern section on the 15th. The largest amount recorded at any station was 5.53, at Chester, and the least, 1.62, at Barnegat. Snow flurries occurred on the 9th and 21st, and frosts on the 1st, 2d, 6th, 9th, 10th, 11th, 22d, and 24th.

New Mexico.—The temperature averaged about normal. No decided cold wave appeared until the 30th, the temperature until that date having been quite seasonable. The highest temperature, 84°, was recorded at Eddy on the 17th and Roswell on the 20th, and the lowest, 15°, at Chama on the 30th. The precipitation averaged somewhat above the normal and was fairly well distributed. The largest amount was 2.11, at Roswell, and the smallest, 0.03, at Raton. Average number of days on which precipitation occurred, 4. A few stations reported light flurries of snow about the last of the month.

New York.—The most noticeable characteristics of the weather were an almost continuous deficiency in temperature (the mean being 4.6° below the normal), broken only by a period of abnormal warmth between the 26th and 29th; scanty rainfall in all sections excepting the southeast; an unusually large number of clear or fair days; and the prevalence of strong southwesterly winds. The highest temperature, 76°, was recorded at West Point on the 3d, and the lowest, 11°, at Bloomville on the 30th. The average precipitation was 1.12 less than normal. The average amount of snowfall was 2.7. On the northern plateau the amount ranged from 4.00 to 10.00; on the eastern and western plateaus, from "trace" to 5.00; in other regions it was generally less than 2.00. The largest amount reported, 27.1, occurred at Turin, while at coast stations 0.00 was reported. A drought of extreme severity prevailed in nearly all sections, and streams and wells were reported by several observers as being lower than at any time during the past twenty years. Frosts were frequent during the first week. The first killing frost on Long Island occurred on the 22d.

North Carolina.—The characteristic features of this month were the continued drought, which lasted practically until the 31st, and the general temperature deficiency. The mean temperature, 56.0°, was nearly 4° below the normal. The highest temperature, 88°, was recorded at Rockingham on the 7th, and the lowest, 18°, at Linville on the 10th and 30th. The average precipitation was 1.86, or 1.80 below the normal. There was an average of but four rainy days. The largest monthly fall, 2.99, occurred at Tarboro, and the smallest, 0.21, at Asheville. The great drought was completely broken on the 31st by general rains, which amounted to an inch or more at a large number of stations. The most serious effects of the drought were to prevent fall plowing and seeding, and to interfere, to a considerable extent, with the running of mills. It was, however, advantageous for the maturing and gathering of late crops, but, apparently, had the effect of increasing the amount of sickness. Frosts occurred frequently; those early in the month did considerable damage to tobacco in the Piedmont section. Ice formed on the 1st, 2d, 3d, 10th, 11th, 20th, 21st, 22d, 25th, 29th, and 30th.

North Dakota.—The month was characterized by an average low temperature and a considerable deficiency in precipitation. There was a general excess of temperature of from 2° to 15° above the normal during the first part of the month, which excess gradually decreased toward the end of the month, when the daily temperatures fell considerably below the normal. The highest temperature, 85°, was recorded at Gallatin on the 12th and 17th, and the lowest, —12°, at White Earth on the 28th, which is lower than any previous record for October. The average precipitation was 0.25, or considerably below the usual amount, the rainfall being very unevenly distributed. The largest monthly fall, 0.65, occurred at University, and the smallest, "trace," at Amenia, Jamestown, Washburn, and Willow City.

Ohio.—The mean temperature was 46.9°, or 4.5° below the normal. The highest temperature, 84°, was recorded at Hebbardsville on the 3d and New Paris on the 5th, and the lowest, 8°, at Coalton on the 30th. The average precipitation was 1.22, or 1.25 less than normal. The greatest amount, 2.97, occurred at Harbor, and the least, "trace," at Dupont. Snow fell at various places in the northern and middle sections on the 3d, 8th, 9th, 12th, 18th, 19th, 20th, 21st, 23d, 24th, 26th, 27th, 28th, 29th, 30th, and 31st, the total amount ranging from "trace"

at most stations to 10.00 at Harbor. The drought is one of the severest on record. Frosts occurred at various points every day, except the 5th, and were mostly heavy enough to kill tender vegetation.

Oklahoma.—The mean temperature was 56.9°, or 4.6° below the normal. The highest temperature, 96°, was recorded at Lehigh on the 16th, and the lowest, 21°, at Lehigh on the 28th. The average precipitation was 3.14, or 0.42 above the normal amount. The greatest monthly amount, 4.59, occurred at Fort Sill, and the least; "trace," at Lehigh. Frosts occurred on the 1st, 9th, 12th, 13th, 19th 20th, 21st, 24th, 25th, 28th, and 31st.

Oregon.—The month was phenomenally dry; in fact, the driest ever experienced within the memory of any pioneer. The average temperature was 53.6°, or 1.6°, above the normal. In the eastern part, however, the temperature was decidedly higher than the average. The highest temperature, 92°, was recorded at Canyon City on the 15th, and the lowest, 6°, at Burns on the 29th. The average precipitation was 0.09, being 3.65 less than, or about 2½ per cent of the usual amount. The greatest amount for the month, 1.37, occurred at Glenora, and the least, 0.00, at eight stations west of the Cascades, and twelve east of them. Frosts occurred at one or more stations on every day except the 1st, 2d, 3d, 5th, 6th, 8th, and 10th to 13th.

Pennsylvania.—The mean temperature was 47.3°, or 2.9° below the normal. The highest temperature, 78°, was recorded at Coatesville on the 3d, South Bethlehem on the 5th and 6th, and at Huntingdon on the 19th, and the lowest, 17°, at Dyberry on the 22d, Hollidaysburg on the 23d and 30th, and Huntingdon on the 30th. The average precipitation was 1.99, or 1.65 less than the normal. The largest monthly amount, 4.63, occurred at Easton, and the smallest, 0.45, at Davis Island Dam. The long continued drought extended until the 12th or 13th, when the surface drought was practically broken in the Delaware Basin and in the eastern portions of the Susquehanna Basin. Heavy rains occurred again in these sections on the 31st. In the Ohio Basin the drought continued, the total rainfall for that section averaging only 0.90. Previous to the breaking of the drought in the Delaware Basin the water in the Delaware River at Philadelphia was quite brackish. Hail occurred on the 8th and 31st; snow, on the 9th, 15th, 17th, 20th, 21st, 22d, 27th, 29th 30th, and 31st.

Rhode Island.—(See *New England.*)

South Carolina.—The weather conditions were extremely favorable for gathering crops, especially corn and cotton, but were unfavorable for pasturage and late root crops. Streams were low, and some wells went dry. The mean temperature was 61.5°, or 2.7° below the normal. The highest temperature, 95°, was recorded at Gillisonville on the 7th, and the lowest, 28°, at Greenwood on the 31st. The average precipitation, 1.15, was 1.95 below the normal, or about 37 per cent of the usual amount. The greatest monthly amount, 2.71, occurred at Society Hill, and the least, 0.09, at Allendale. Frosts occurred on the 1st, 7th, 10th, 19th, 20th, 21st, 22d, and 24th. That on the 20th and 21st in the western counties killed vegetation; in other sections the injury by frost was slight.

South Dakota.—The month was unusually dry, the effect on streams and shallow wells being quite noticeable. The weather was, however, generally favorable for the late thrashing of small grain and stock feeding on the ranges. The mean temperature was 45.0°, or about 2° below the normal. The highest temperature, 89°, was recorded at Cherry Creek (Leslie P. O.) on the 12th, and the lowest, 11° below zero, at Shiloh, on the 29th. The average precipitation was 0.20, or 1.14 less than the usual amount. The greatest monthly amount, 0.60, occurred at Bowdle, and the least, "trace," at five stations.

Tennessee.—The mean temperature was 53.4°, or several degrees below the normal, and is the lowest recorded during the past thirteen years. The highest temperature, 89°, occurred at Harriman on the 19th, and the lowest, 22°, at Elizabethton on the 30th. The average precipitation was 1.89, or nearly 1.00 less than normal. The greatest monthly amount, 4.20, occurred at Sewanee, and the least, 0.60, at McKenzie. The drought was partly broken on the 7th and 8th, but it was not until the 31st that general soaking rains prevailed. Frosts and thin ice were reported from various stations throughout the State from the 1st to the 31st.

Texas.—The temperature averaged 4.1° below the normal. There was a general deficiency of temperature throughout the State. The highest was 96°, at Houston, on the 18th, and the lowest, 30°, at Wichita Falls, on the 8th. The precipitation was very irregularly distributed, but averaged only about 0.04 less than the usual amount. The greatest monthly amount, 6.86, occurred at Temple, and the least, 0.00, at Fort Ringgold. Frosts occurred on the 13th, 14th, 15th, 19th, 20th, 28th, 29th, and 31st.

Utah.—The mean temperature was 49.2°; the highest recorded, 95°, occurred at St. George on the 2d, and the lowest, 10°, at Castle on the 31st, and at Soldiers Summit on the 29th. The average precipitation was 0.56. The greatest monthly amount, 1.28, occurred at Grover, and the least, 0.04, at Logan. Snow, to the depth of 1.5 fell at Moroni, and inappreciable amounts at Grover and Loa.

Vermont.—(See *New England.*)

Virginia.—The month did not show any great variations in temperature, but preserved a rather uniform condition throughout. There were local changes where the range was considerable, but for the State, as a whole, no great changes are apparent. The mean temperature was 52.5°; the highest was 87°, at Bob Air, on the 4th, and the lowest, 14°, at Blacksburg on the 30th. The average precipitation, 1.71, was somewhat below the normal, though it fell in a very beneficial manner—a series of gentle showers. The greatest monthly amount was 4.15, and occurred at Birdsnest, and the least, 0.16, at Monterey. Frosts occurred on the 1st, 2d, 3d, 4th, 9th, and 10th, and ice on the 1st, 2d, 3d, 4th, 10th, 21st, 22d, 29th, and 30th.

Washington.—The mean temperature was 50.9°, or only 0.7° above the normal. The highest temperature was 85°, at Centerville on the 9th, and at Kennewick on the 13th, and the lowest, 12°, at Fort Spokane on the 27th. The average precipitation, 0.33, was 2.63 less than the usual amount. The greatest monthly amount was 1.70, at Monte Cristo, and the least 0.00, at several stations.

West Virginia.—The mean temperature was 48.0°, or about 5° below the normal. The highest temperature recorded was 89°, at Nuttallburg and Pennsboro on the 4th, and the lowest, 8°, at Nuttallburg on the 31st. The rainfall was extremely light, the average, 1.29, being about 2.00 less than the usual amount. The greatest monthly amount was 2.25, and occurred at Beverly, and the least, 0.16, at Harpers Ferry. Snow occurred on the 7th, 8th, and 9th, and sleet on the 31st.

Wisconsin.—Low midday and cold night temperatures, below the freezing point, prevailed generally throughout the month, rendering it the coldest October on record. The mean temperature was 41.9°, or 6.0° below the normal. The highest temperature reported was 80°, at Grantsburg on the 4th, and the lowest, 1.0°, at Valley Junction on the 30th. The average precipitation was 0.84, or 1.89 less than the usual amount. The greatest monthly amount was 1.40 at Koepenick, and the least, 0.04, at Grantsburg. The rainfall was not only deficient but was poorly distributed. The general droughty conditions continued; lakes and streams were drying up and forest and marsh fires increasing in number and extent. Snow fell during the last week and was from 1.00 to 4.00 deep over the northern portion at the close of the month.

Wyoming.—The mean temperature was 45.0°, or about normal. The highest temperature reported was 89°, at Wheatland on the 1st, and the lowest, 9°, at Lusk on the 28th. The average precipitation was 0.70, also about the usual amount. The greatest monthly rainfall was 2.00, at Wheatland, and the least, 0.00, at Lusk.

SPECIAL CONTRIBUTIONS.

REPORT UPON THE EARTHQUAKE OF OCTOBER 31, 1895.

By C. F. MARVIN, Professor of Meteorology, U. S. Weather Bureau.

An earthquake of sufficient severity to arouse many persons from sleep and otherwise attract notice occurred shortly after 5 a. m. ninetieth meridian time, of October 31. The damage resulting therefrom was confined to the overthrow of some chimney tops, the cracking of walls of brick or masonry buildings, the falling of plaster, and the breaking of household ornaments, etc. The disturbance was felt over a comparatively extensive region, embracing New Mexico and Nebraska on the west, some portions of Canada on the north, Louisiana and Georgia on the south, and North Carolina and the District of Columbia on the east.

Without special solicitation of information relating to this earthquake, the Weather Bureau has received through its corps of observers, and from the Geological Survey and a few other sources, about 300 reports, abstracts of which are given at the close of this account.

Earlier shocks.—An earthquake on October 11 was reported by several observers, as follows:

A. S. Ammerman, Rochford, S. Dak.: At 5.55 p. m.; lasted seven seconds; a low rumbling noise; only one shock felt; intensity light, on a scale of 5; appeared to travel from northwest to southeast.

P. Haunnerquist, Farmingdale, S. Dak.: Lasted about one minute; like a wagon going past the house; intensity very light.

W. H. Zimmerhoff, Hill City, S. Dak.: At 7.30 p. m.; lasted two or three minutes; rumbling like a heavy wagon; only one shock felt; intensity light.

Fred. J. Cross, Keystone, S. Dak.: Felt at 7.15 p. m. sun-

time (longitude 103° 22′; therefore, this apparent solar time is equivalent to 8.08 p. m., ninetieth meridian time); lasted about ten seconds. The shock was preceded by a rushing or hissing sound for three or four seconds, like the wind blowing through brush. It was followed by a rumbling sound, similar to a heavy wagon on hard ground; this lasted two or three seconds; then came this heavy jarring shock; two shocks were felt. The workmen on the night shift in the mills and mines say that there was another shock about 3 a. m. of the 12th. The intensity was 3, or moderate, on a scale of 5.

Mr. Jacob Brobst, the voluntary observer at Corning, Clay Co., Ark., reports that light shocks of earthquake were felt on October 30, at 8.30 a. m., and at 2 and 4.30 p. m., in addition to the heavy shock on the morning of the 31st.

Messrs. Powell and Hammel, the voluntary observers at New Madrid, New Madrid Co., Mo., report the occurrence of two light shocks on October 18 at 12.10 and 3 a. m.; also, the severe shock of October 31.

Whether these disturbances were real earthquakes and related in any way to the greater shock of the 31st, or were in any cases accidental local disturbances supposed to be earthquakes, is difficult to determine.

Causes of earthquakes.—Concerning the causes of earthquakes, Professor Abbe remarks as follows:

> According to views commonly accepted in geology, the so-called solid crust of the earth consists of an unknown depth of granite and gneiss, on top of which are 5 or 10 miles of metamorphic and sedimentary strata. This crust is everywhere in a state of strain, due to various kinds of stress; in other words, the outward bulgings that make the continents and the mountain ranges, or the downward bendings that have made the ocean beds, represent strains that frequently become too severe for the rocks to resist. Moreover, in special localities there are upward-pressing masses of lava or other plastic material that produce great local strains. In other places the strata that ages ago were tilted up to make a mountain are still in a state of strain, and, notwithstanding the long interval that has elapsed, are occasionally cracking and sliding on each other. These various stresses have produced the innumerable cracks that we see in the smaller beds of rock and the faults that the miner discovers in his attempt to follow up a vein of mineral ore. Even the tidal action of the sun and moon and the variations in barometric pressure and in the loads of snow and alluvium can produce appreciable effects.
>
> Small cracks, with attendant shocks, are continually occurring everywhere throughout the globe. Some localities are famous for mysterious noises that have almost in every case been traced to the sudden cracking of rocks near the surface. Such are the famous Moodus noises at the town of that name in Middlesex County, Conn., where the Salmon River empties into the Connecticut River. Such sounds are heard at the famous gneiss quarries of Monson, Hampden County, Mass.; whenever a large piece of rock is loosened, loud, crackling noises are produced. On the slopes of Black Mountain, N. C., in 1876, many mysterious noises were heard, until, finally, it was discovered that a large portion of rock was crackling and settling.

In a recent number of Nature, Vol. LIII, p. 4, Professor Davidson remarks on these slight earthquakes as follows:

> Is it not possible that the "Berisal guns" and "mist pouffers," referred to by Professor Darwin (p. 650), are merely earthquake sounds, the attendant shock being too slight to be otherwise perceptible? Nearly all earthquakes are accompanied by a rumbling sound, due, I believe, to the small and rapid vibrations proceeding chiefly from the margins of the area over which the fault-slip producing the earthquake takes place. (Geol. Mag., Vol. IX, 1892, pp. 208–218.) In some districts (Comrie, in Perthshire; East Haddam, in Connecticut; Pignerol, in Piedmont; Meleda, in the Adriatic, &c.) sounds without shocks are common during intervals which may last for several years, but slight shocks with sound occasionally intervene, as if the sounds and shocks were manifestations, differing only in degree and the method in which we perceive them, of one and the same phenomenon. In great earthquakes the sound area is confined to the neighborhood of the epicenter; in moderate and slight shocks the sound area and disturbed area approximately coincide, or the sound area may even overlap the disturbed area. In the limiting case the disturbed area vanishes, and the vibrations are perceptible only as sound.

Accuracy of time very important.—Inasmuch as there is not any organized effort made to accurately observe earthquake phenomena in the United States, the popular and voluntary reports of such disturbances are alone available; but the study of these is not fruitful of definite and conclusive results, owing both to the lack of information respecting details that can not be observed except by instrumental appliances, and to the need of greater exactness than can be expected from miscellaneous reports by untrained observers.

While the introduction of standard time and its general use throughout the country has greatly increased the value of the ordinary reports of the time of occurrence of an earthquake, yet the speed of propagation of seismic disturbances is so great that it can not be even approximately determined, unless the time is observed with a much greater degree of precision than is usual in the ordinary popular report. Very few people pay any regard to the second hands on their watches, and probably never use them, even if they wish to note the time accurately. Indeed, it will generally happen that there is a noticeable discordance between the second and minute hand of almost any watch one may please to examine. When the minute hand is exactly over one of the minute marks of the dial, the second hand should be exactly over the 60-point on its dial. In the majority of cases, however, the second hand will be found to be at other points on its dial, and a discordance of as much as thirty seconds may exist in this way. In using such a watch an accidental error of a whole minute of time may be made from this cause. Especially is this possible if one takes account of the position of the second hand and seeks to find the error of his watch by comparing it with some standard time. It is hoped that some of those who may read these remarks, and who may carry good watches (there are many such), will cultivate the practice of placing the minute and second hands in accord with each other when setting their watches. If at the moment of setting, the second hand is one-quarter, one-half, or two-thirds, etc., of the way around its dial, the minute hand should be set at one-quarter, one-half, or two-thirds, as the case may be, of the distance between the two proper minute lines on the dial where the hand is to be set.

In the case of earthquakes the exact time of the beginning of the disturbance, or better, of some pronounced maximum, and, if possible, a close determination of the duration of the whole series of oscillations constitute the most valuable features that can be noted by personal observation.

Direction of shock.—Much attention is often concentrated upon what seems to be the direction of propagation of the disturbance. An intimate knowledge of the nature of the actual movement of the earth at one's feet during an earthquake and of the manner in which surrounding objects are affected by such movements, will show how erroneous it is to suppose that the direction of progression of the disturbance can be determined by reference to such effects. In Japan, where earthquakes occur frequently, they have been made the subject of the most exact observation and measurement by instruments that give a complete trace of every phase of the earth's movement. From records thus obtained the exact movement of the earth at the instrument during every instant of the entire disturbance has been worked out for many earthquakes.

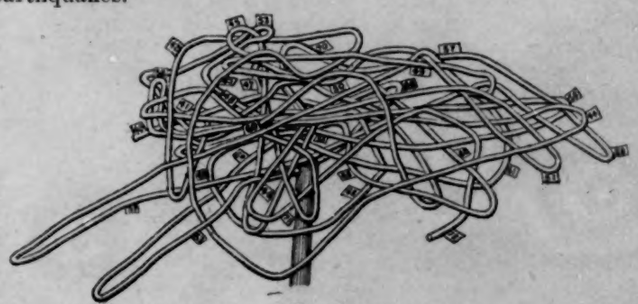


FIG. 1.

Figure 1 is a picture of a wire that has been so bent as to represent the recorded path of the ground and the instrument during a portion of one of these earthquakes. The wire takes up the record after the earthquake has been on for forty seconds, as is shown by the tag, No. 40, attached to the wire at this end. The other end of the wire comes out at the tag, No. 72, which marks the position of the earth particle at the seventy-second second of the disturbance. The wire shows the motion on a greatly magnified scale, the actual motion, being only a small fraction of an inch.

If the reader will follow closely the entangled windings of the wire he will acquire a comparatively correct idea of the extremely erratic and complex nature of the movement of the earth's surface at any point during a seismic disturbance. It must be plain also that motions occurring in such a confused snarl and in every possible direction, contain in themselves no evidence whatsoever of the direction of progression of the disturbance. Furthermore, when one reflects upon the effect such motions will have upon the walls of houses, which, it must be observed, are more susceptible to the influence of motions in some directions than in others, and therefore do not move precisely as the ground does; and when one considers, furthermore, the effect of these modified motions of the walls and floors upon suspended objects, such as pictures, mirrors, chandeliers, etc., or in causing the overthrow of insecure objects—it becomes apparent that the upsetting of an unstable vase, for example, in a certain direction, or the swinging of a mirror or chandelier after a certain fashion within a house can not be admitted to represent with any accuracy, either the nature of the motion of the earth immediately under the house where the observations are made, or the direction whence the wave came or whither it went.

Reports specifying direction of progression of the recent earthquake exhibit, as might be expected, marked discordance with each other in this respect. This element of the report, though sometimes given, is not regarded as of any special significance.

Speed of the wave.—The only means of ascertaining the speed and direction of motion of the earthquake wave is by a comparison and charting of the times of occurrence at different places. The trembling of the earth takes place at a later moment of absolute time the greater the distance from the real origin. In the case of the Charleston earthquake, the speed of the wave was worked out with great care by Capt. C. E. Dutton, of the Geological Survey, and found to be 3.22 miles per second.

Many more reports than those discussed herein could doubtless have been obtained had an effort been made to secure them, but the labor involved in such an undertaking (incident to the sifting of good reports from the bad, and to the laborious mathematical treatment necessary before results of even a fair degree of accuracy could be deduced from a large number of inferior observations) seemed entirely disproportionate to the profit to be gained, especially as the writer has been so closely occupied with other important investigations that but little time could be devoted to these earthquake studies. The present summary will impress the reader with the fact that the most important thing, by far, to observe at the time of an earthquake is the exact time of occurrence to the nearest second, if possible, and this time should, if possible, be the moment of some pronounced phase, such as the maximum of severity. The beginning and ending of an earthquake are a series of imperceptible tremors, and the times of beginning and ending are less definite and not as useful for study as the time of greatest violence, but should be observed, if possible. To merely note the time on one's watch, or other timepiece, is by no means sufficient. The timepiece must be compared at the earliest possible moment with some regulator, or other standard of time, and allowance be made for the errors, not only of the watch or timepiece employed, but of the regulator itself. The best results are obtained when comparison can be made directly with the standard time signals telegraphed each day to almost every city and town. If an observer wishes his report of the time of occurrence of an earthquake to serve any useful purpose, he can not expend too much care in noting the exact minute and second, if possible, or at least the tenth of a minute, and in afterwards finding out exactly the error of the timepiece employed. A hundred accurately made time reports, over a region disturbed by an earthquake, would be more valuable than thousands in which the time is stated to be "about 6 a. m.," or "a few minutes after 6," or in which the time appears to be stated to the nearest five minutes only.

The earthquake of October 31.—Although at a few points within the region affected seismic instruments had previously been installed, yet from long inaction and neglect none of these were in condition to make a record when this earthquake finally came. There is a marked exception to this, however, in the case of the seismograph at the U. S. Weather Bureau at Washington, D. C., which faithfully made a perfect, and the only exact record of the time of occurrence of the disturbance at this place. The apparatus was fully described in the July REVIEW, and this is the second earthquake recorded since the installation of the instrument.

As recorded by this seismograph the time at Washington was 6 h. 13 min. 15 sec. a. m., seventy-fifth meridian time. Two other instrumental records of the time were obtained, respectively, one from the weighing rain gauge on the top of the Auditorium Tower in Chicago, and the other from a similar gauge on the roof of the post office in St. Louis. The times from these records, are 6.07 and 6.08, respectively. This instrument consists of a poised balance, so arranged, electrically, that a gradual accumulation of weight in a receptacle for collecting rain on one end of the balance causes the recording pen to mark on the register the total weight collected. When disturbed by agitations the balance will oscillate, and thus set up an electrical action that results in a record as if a small weight had been added to the receptacle. In the case of Chicago, with the gauge on the top of the lofty Auditorium Tower, the record indicated an effect equal to that produced by adding a weight of a little less than half an ounce to the collector of the gauge. The record at St. Louis, where the gauge is located upon a lower and consequently more stable building, showed an effect no more than one-third as great.

In order to reach some conclusion as to the validity of these records (similar ones being easily produced by wind and other causes), experiments were made with a gauge at Washington by mounting it upon a shaky table. The whole observed effect was easily reproduced by imparting to the table a vibratory motion, and particularly if this motion was not allowed to take place in any one plane nor be rythmic in character, but was made to be irregular, jerky, and in all directions. It is believed that these experiments show the observed records to be unquestionably the result of an earthquake. Unfortunately, however, their value as time records is but slight, owing, first, to the fact that the time can not be obtained from the sheet to within less than one minute (= one-sixtieth of an inch on the scale of the record sheet); and, second, from the fact that the error in setting the sheet to standard time is unknown, and is easily liable to exceed a whole minute. In the case of the St. Louis record the official does not appear to have known that his rain gauge contained a record of the earthquake, and his report of the observed shock states a time two minutes later than shown on the record.

Although our observers frequently quote the times at which clocks were stopped by earthquake shock, yet but little weight can be given to these records in any investigation that aspires

to great accuracy, owing to the fact that violent disturbances often fail to stop a clock which is subsequently stopped by a very feeble shock. In general, when a clock is stopped by an earthquake it is liable to run irregularly for a considerable number of beats before actually stopping, as any one can demonstrate for himself by experiment on his own clock; moreover the error of the stopped clock is generally unknown.

A critical examination of all the time reports shows that by far the greater part of them are so inexact as to be of no value whatsoever in fixing the speed of the wave. A few, only, can pass the requirements of good observations. Many people in noting time consider only the nearest five minutes, and this practice is clearly apparent in the reports. Out of 264 reports, 196 express the time as "about 6," "a few minutes after 6," or as some multiple of 5. While it is not impossible that some of these times may be as trustworthy as others which are regarded as better, the probabilities are that the number of these must be quite small, and it is impossible to tell which they are. Furthermore, as the time at Washington is unquestionable, and as it is probably the most distant point at which the shock was felt, all other accepted times must not be later than this. Moreover times earlier than 6.00 can not be regarded as relating to the shock in question. On this score 94 reports must be rejected. Of those that remain, 58 give the time as about 6 o'clock, or a few minutes after 6, or are otherwise too indefinite to be accepted

This course of selection leaves 112 reports yet to be dealt with. Of these, 46 state the time to be "6.05" and "6.10," and none of these contain internal evidence that the time is to the nearest minute rather than to the nearest five minutes.

There does not appear to be any rational basis by which these times can be properly incorporated with the others, and they also must, therefore, be rejected. The reports that remain arrange themselves, curiously enough, in two groups, one on the time 6.07 or 6.08, the other on the time 6.12. The idea that there might have been two shocks about five minutes apart is not sustained by the detailed accounts.

The following reports of the time were accompanied by such explanations as to the manner of observing, the comparison of watches, etc., as to render them the most exact measurements obtained:

Cairo, Ill., W. T. Blythe, L. F. O., 6 hr. 7 min. 30 sec.

Rock Island, Ill., J. A. Udder, observed ending, 6 hr. 11 min. 45 sec.; duration about fifty seconds.

Mount Vernon, Iowa, Miles E. Mitchell, 6 hr. 11 min. 30 sec.

Mount Vernon, Iowa, W. H. Norton, 6 hr. 12 min. 10 sec.

Washington, D. C., Weather Bureau, seismograph, 6 hr. 13 min. 15 sec.

The following times are reported with some appearance of accuracy, but not enough detail is given to justify us in assigning them the first rank:

Corning, Ark., 6 hr. 8 min. 30 sec. to 6 hr. 10 min. 0 sec.

Anderson, Mo., 6 hr. 10 min. 48 sec.

Blaine, Kans., 6.15 to 6.17.

Pleasure Ridge, Ky., 6 h. 8 min. 45 sec.

Glasgow, Mo., 6.13.

Milan, Tenn., 6.09 to 6.10.

Warrenton, Mo., between 6.08 and 6.09.

Golconda, Ill., 6.02 to 6.03.

Abstracts of observers reports.—The reports show the disturbance to have been felt, more or less, throughout the following States: Alabama, Arizona, District of Columbia, Georgia, Illinois, Indiana, Kentucky, Maryland, Michigan, Mississippi, Nebraska, North Carolina, Ohio, Oklahoma, Pennsylvania, South Carolina, South Dakota, Tennessee, and Wisconsin.

The reports of the severity of the shock do not allow any definite conclusion to be reached as to its approximate origin or region of greatest violence. In a general way the region in the vicinity of and northeast of the junction of the Ohio and Mississippi rivers seems to have experienced the strongest shocks. The lack of definite knowledge on this point constitutes a further difficulty in the analysis of the time reports, which are too small in number or too inexact in character to indicate in themselves the center of the disturbance.

The following extracts from reports of the regular Weather Bureau observers will afford an idea of the character of the shock in the different sections affected (these records are all converted into seventy-fifth meridian time):

Augusta, Ga.—Shortly after 6 a. m. to-day a number of persons felt a slight earthquake shock, which, from all accounts, lasted about a second or two; the tremor was just perceptible by the rattling of windows; direction of vibration could not be ascertained.

Cairo, Ill.—A severe earthquake shock occurred a few minutes after 6 a. m. The time, as determined by the local forecast official by comparing his watch with seventy-fifth meridian time later in the day, was between 6.07 a. m. and 6.08 a. m., seventy-fifth meridian time. The local forecast official was in bed at the time the shake began, but was fully awake. Its duration, as estimated by considering his movements from the time it began till it ended, and also from the experience of others, including Mr. J. W. Byram, Observer, is believed to have been from thirty-five to forty-five seconds. There is great diversity of opinion as to the direction of the waves, if waves there were. The majority of persons, however, claim that the movement was from east-northeast to west-southwest. The fact that the local forecast official, raised himself on his elbow, remaining in that position *some* time, then arose, felt his way (it was dark) around the foot of the bed to the dresser, and lighted the gas during the occurrence, without feeling any oscillatory motion, causes him to believe that the shock was a severe tremor. No noise, other than that of the cracking and creaking timbers in the house, the rattle of crockery and glassware, and the falling and breaking of parlor and dresser ornaments, was heard. The losses due to broken china and glassware, ornaments, etc., aggregate quite a considerable sum. The number of chimneys shaken down in the city probably runs into the hundreds. The plaster in nearly all frame buildings was more or less damaged. But the brick and stone buildings suffered the most serious damage, though none fell and probably none were rendered uninhabitable. The following are a few of the injured buildings: The county court house, chimneys above the roof shaken down; walls badly cracked. The large brick office building belonging to and occupied by the Cairo Trust Co., chimneys fell, slate roofs damages, walls cracked. The Safford Public Library, walls badly cracked and the front gable parted from the roof; left standing, but in a dangerous condition, and will have to be removed and replaced. St. Joseph's Catholic Church, brick steeple cracked and twisted; will have to be removed and rebuilt at an estimated cost of $1,000 to $1,200. The United States custom house (stone), old cracks opened and new ones made. A large number of buildings in the downtown business district were damaged by walls being cracked and plate glass fronts broken.

Charleston, S. C.—Light earthquake shock at 6.04 a. m.; light tremors and vibrations lasting about eight seconds.

Charlotte N. C.—An earthquake shock was felt by several persons in the city at 6.15 this morning, the vibration lasting about ten seconds. The shock was extremely light and was felt by so few persons that it was not positively known that it was an earthquake shock until in the evening, when dispatches were received by the newspapers stating that the shock had been noticed at other points. The direction of the vibration was not noticed.

Chattanooga, Tenn.—An earthquake shock was felt in this city at 6.10 a. m. to-day; motion east and west; duration of the vibration, thirty seconds. No effect in this city outside of shaking chandeliers, rocking ofh ouses, rattling of windows, and rocking of beds.

Chicago, Ill.—An earthquake shock was felt in the morning at about 6.07 a. m. all over the city. The rain gauge register shows a decided jar at that time, no doubt caused by the shock. The shock was also felt at Downers Grove, about 15 miles west of the city on the Burlington road. The shock lasted from fifteen to thirty seconds.

Cincinnati, Ohio.—An earthquake shock was very generally felt in this city at 6.05 a. m. Two distinct waves of motion, apparently from south to north, were felt in quick succession. Buildings wavered, furniture was moved, windows rattled, and beds (in which most people at that early hour were still resting) rocked like cradles. Clocks were stopped, pointing to 6.05 a. m. While a great deal of alarm and consternation was created by the tremble, no injury or serious damage was sustained.

Columbia, Mo.—A slight earthquake shock was felt at 6.08 a. m. No damage reported.

Columbia, S. C.—There was a slight earthquake shock felt between 6.15 and 6.30 a. m. It was not severe enough to awaken persons sleeping, but was very perceptible to those who were awake. The vibrations lasted about thirty seconds, and from the swaying of oil in a lamp by my bedside it was thought that the wave direction was north and south.

Concordia, Kans.—A slight shock of earthquake was felt in this city at 6.12 a. m. Mr. James, train dispatcher at the Central Branch Railroad, who was on duty at the time, states that there were three distinct shocks, about fifteen seconds apart.

Davenport, Iowa.—A moderate earthquake shock was felt this morning about 6.12 o'clock. The direction, amplitude, or intensity of the seismic disturbance could not be determined.

Des Moines, Iowa—There is said to have been a slight earthquake at about 6.00 a. m. Three shocks are reported, the waves moving from east to west.

Fort Smith, Ark.—A very slight earthquake shock was felt by a few individuals here at a few minutes past 6 o'clock a. m., but without any rumbling noise. Of about fifty persons asked relative to the shock only two stated that they felt it—Dr. Hatchett, a practising physician, and Mr. W. Abbot, lumber merchant. Dr. Hatchett reports the motion as lateral, but does not know the direction of movement; Mr. Abbot states the movement was toward the west. The Weather Bureau observer did not feel the shock.

Grand Haven, Mich.—Sharp earthquake shock felt this morning about 6.20, the vibrations lasting fully one minute. No damage was done.

Hannibal, Mo.—A seismic disturbance, or earthquake shock, was very perceptibly felt at this station at 6.12 to 6.13 a. m., lasting fully one minute, and causing some damage to brick buildings by cracking the walls.

Indianapolis, Ind.—An earthquake occurred about 6.11 a. m., lasting about four seconds. I did not feel it, but Mr. Albright, who takes the a. m. observation, reports that he felt the first shock very distinctly at 5.11 a. m. He could feel a trembling for about four seconds, and then he felt a second shock, then he felt trembling for about two seconds, and then a third shock. The second shock was the strongest; no trembling was felt after the third shock. In the city and State most people were awakened by the disturbance. No damage was done in the city.

Kansas City, Mo.—Two very distinct earthquake shocks were felt at 5.12 a. m., lasting about one-half a minute. It was general in this locality, and from newspaper reports, extended over a wide belt. The official in charge of station was not awakened by it, nor any member of his family. Mr. Young, an assistant, and his family were not disturbed. Mr. Coup and Mr. Hall, assistants, distinctly felt the vibrations as though some persons were under their beds, moving them. Some parties who are supposed to know more than others about such matters, state that the vibrations were vertical. Not the least suggestion of damage in this part of the country.

Keokuk, Iowa.—At 6.15 a. m. a slight earthquake shock was felt, preceded by low, rumbling sounds. Motion from south to north, lasting about ten seconds, then an interval of about ten seconds and a second motion of about ten seconds felt; motion swaying light objects, such as lamp shades, hanging pictures, &c.

Knoxville, Tenn.—About 6.00 this morning several distinct shocks of earthquake are reported to have been felt all over this city, more particularly on the outskirt of the town. The shocks are reported to have been from east to west and were very perceptible.

Little Rock, Ark.—Distinct earthquake, the vibrations being east and west and lasting about one minute, occurred at 6.15 a. m. Shock was also felt at Forrest City, Helena, Brinkley, and several other points in eastern Arkansas.

Louisville, Ky.—Three distinct and very severe earthquake shocks were experienced this morning. The first occurred at 6.07 a. m., and was followed a few seconds later by a second, and, after a brief interval, by the third and most violent. While no serious damage resulted, the vibrations were of sufficient force to cause the ringing of bells, the rocking of articles of furniture, and the displacing of ornaments and other articles from tables and mantels. The disturbance appeared to proceed from the northwest toward the southeast. A number of persons state that a slight shock occurred shortly after midnight, and many report that the main shock this morning was accompanied by a brilliant flash of light, resembling lightning. The earthquake was very general throughout Kentucky and was apparently most severe in the extreme western counties.

Memphis, Tenn.—An earthquake shock of considerable severity was felt in this city this morning shortly after 6 o'clock. A careful comparison of time by a number of competent observers shows that the vibrations from the first shock ceased at 6 hr. 07 min. 30 sec. a. m., having lasted about thirty seconds. A secondary shock or vibration was observed at 6 hr. 14 min. 00 sec. by a number of reliable observers, though not by all. There was no damage done in this city, except to two chimneys in the suburbs, which were shaken down.

Meridian, Miss.—Light earthquake shock said to have been felt in the early morning.

Montgomery, Ala.—Light earthquake felt in the city at 6.30 a. m. today; windows rattled and beds were shaken; no damage. The reports from different towns in the State show the earthquake to have been felt throughout the State.

Nashville, Tenn.—An earthquake visited the city about 6.05 a. m.

Omaha, Nebr.—Shortly after 6 o'clock this morning a slight earthquake shock was reported by reliable persons to have been felt in this city. The shock was not felt by any of the station force. No damage from the shock was reported.

Parkersburg, W. Va.—At 6.15 a. m., several (about three) distinct earthquake shocks were felt. The first shock was the most severe, and was followed by long, gentle undulations, having directions from southwest to northeast, as nearly as could be told.

Pittsburg, Pa.—A slight earthquake shock was felt at Bellevue and McKeesport, suburbs of Pittsburg, at 6 a. m. The shock produced only a very slight jar and a slight movement of pictures, etc., hanging on walls, and continued but a few seconds.

St Louis, Mo.—A slight shock of earthquake was felt at 6.10 a. m., lasting about fifteen seconds. The direction of vibration was from east to west. No damage of consequence reported.

Springfield, Ill.—Quite a distinct earthquake shock, or series of shocks, was felt in the vicinity at exactly 6.16 a. m. It was accompanied by a rumbling sound, and was sufficiently strong to rattle windows. The apparent movement was from west to east. It lasted about fifteen seconds.

Springfield, Mo.—At 6.13 an earthquake shock was felt. The vibrations apparently were from the east to the west, and lasted about five seconds. It was accompanied by a sharp report and a rumbling noise. This rumbling noise was heard for twenty seconds after the shock was felt, and seemed to grow fainter and fainter, like the passing of a railroad train. No damage resulted in this locality from the phenomenon.

Toledo, Ohio.—Earthquake shock felt at 6.12 a. m.; no damage.

Topeka, Kans.—An earthquake shock about 6.12 a. m., but the observer was not awaked by it, though a large number of citizens were.

Vicksburg, Miss.—An earthquake shock was reported, upon reliable authority, in the vicinity of station at 6.03 a. m. Its duration was fifteen to twenty seconds, and was apparently continuous. It was accompanied by no unusual noise. The word moderate would best describe its intensity, and there was no other cause for what happened than an earthquake.

Observed times of occurrence of earthquake of October 31.

Stations of Weather Bureau.	Time—75th meridian.	Stations of Weather Bureau.	Time—75th meridian.
Augusta, Ga	Shortly after 6.00.	Louisville, Ky.	6.07.
Cairo, Ill.	Between 6.07 & 6.08.	Memphis, Tenn.	6.07.
Charleston, S. C	6.04.	Montgomery, Ala.	5.30
Charlotte, N. C	6.15.	Nashville, Tenn.	About 6.05.
Chattanooga, Tenn.	6.10.	Omaha, Nebr	Shortly after 6.00.
Chicago, Ill.	About 6.07.	Parkersburg, W.Va.	6.15.
Cincinnati, Ohio	6.05.	Pittsburg, Pa	6.00.
Cleveland, Ohio.	About 6.15.	St. Louis, Mo	6.10.
Columbia, Mo.	6.08.	Springfield, Ill.	6.16.
Columbia, S. C.	Between 6.15 & 6.30.	Springfield, Mo	6.13.
Columbus, Ohio.	About 6.12.	Toledo, Ohio.	6.12.
Concordia, Kans.	6.12.	Topeka, Kans.	About 6.12.
Davenport, Iowa	About 6.12.	Vicksburg, Miss	6.03.
Des Moines, Iowa.	About 6.00.	Washington, D. C	$6^h\ 13^m\ 15^s$.
Fort Smith, Ark	Few min. after 6.00.	*Various sources.*	
Grand Haven, Mich.	About 6.20.	Mt. Vernon, Iowa.	$6^h\ 11^m\ 30^s$.
Hannibal, Mo.	6.12 to 6.13.	Do.	$6^h\ 12^m\ 10^s$.
Indianapolis, Ind.	About 6.11.	Centerville, Ind.	About 6.30.
Kansas City, Mo.	6.12.	Evansville, Ind.	6.12.
Keokuk, Iowa	6.15.	Rock Island, Ill.	Observed ending $6^h\ 11^m\ 45^s$; duration about 50 seconds.
Konxville, Tenn.	About 6.00.		
Little Rock, Ark.	6.15.		

Reports by voluntary observers of the Weather Bureau.

Voluntary observers.	Time—90th meridian.	Voluntary observers.	Time—90th meridian.
Alabama.		*Illinois*—Cont'd.	
Birmingham	4.00.	New Burnside	5.10, very heavy.
Madison	5.00.	Olney	5.09.
Tuscaloosa	About 5.10.	Ottawa	5.10.
Union	About 5.00.	Palestine	5.30.
Arkansas.		Peoria	5.10.
Brinkley	5.10.	Rantoul	5.15.
Forest City	5.15.	Catlin	5.00.
La Crosse	5.15.	Cazenovia	Light, about 5.05.
Osceola	5.10.	Coatsburg	5.12.
Pocahontas	5.00.	Decatur	5.12.
Helena	5.15.	Flora	5.05, severe.
Corning	Bet. $4^h\ 8^m\ 30^s$ & 5.10.	Friend Grove	5.15.
Georgia.		Galva	5.09.
Dahlonega	5.30.	Gilman	5.15.
Griffin	5.50.	Golconda	5.02 to 5.03, very heavy.
Lagrange	5.00.	Greenville	5.07.
Rome	5.15.	Havana	5.15.
Illinois.		Hillsboro	5.10.
Albion	5.00, heavy.	Iron	About 5.30, very heavy.
Alexander	5.00.	Jordans Grove	About 5.05.
Atlanta	5.15.	Lanark	5.10.
Atwood	5.00, severe.	Lexington	5.15.
Atwood	5.00.	Reynolds	5.00 to 5.00.
Beardstown	Slight, about 5.00.	Rockford	5.20.
Bushnell	About 5.15.	Tuscola	About 5.15, heavy.
Carlinsville	5.10, severe.	Winnebago	5.00.
Carrollton	5.12.	*Indiana.*	
Louisville	5.07.	Anderson	$5^h\ 10^m\ 48^s$.
McLeansboro	5.12.	Bluffton	4.55.
Martinsville	5.15.	Butlerville	About 5.00, severe.
Mattoon	5.10, quite heavy.	Cambridge City	5.10.
Mount Pulaski	5.15.		
Mount Vernon	5.10.		

Reports of voluntary observers—Continued.

Voluntary observers.	Time—90th meridian.
Indiana—Cont'd.	
Columbus	5.05.
Connorsville	5.10.
Delphi	5.15.
Edwardsville	Shortly after 5.00.
Evansville	5.09.
Farmland	5.15.
Huntingbury	5.15 heavy.
Huntington	About 5.00.
Jasper	About 5.18.
Jeffersonville	5.28.
Kokomo	5.10.
Lafayette	5.12 to 5.15.
Logansport	5.15.
Lyford	About 5.00.
Madison	At 5.06.
Marion	5.10.
Mount Vernon	5.15, severe.
Princeton	5.15, severe.
Rockville	5.15.
Scottsburg	About 5.00.
Seymour	5.10.
South Bend	Few min. after 5.00.
Syracuse	5.10.
Terre Haute	5.13.
Topeka	5.00.
Valparaiso	About 5.15.
Vevay	5.10, strong.
Iowa.	
Ames	5.20.
Cedar Rapids	Little past 5.00.*
Chariton	5.10.
Dubuque	5.15.
Fairfield	5.00.
Fort Madison	Few min. past 5.00.
Glenwood	About 5.00.
Grinnel	5.20.
Iowa City	5.07.
Marshalltown	About 5.00.
Moran	4.50.
Mechanicsville	5.12.
Mooar	5.05.
Mount Pleasant	5.16.
Mount Vernon	5.13.
Ottumwa	5.05.
Sydney	5.10.
Winterset	5.30.
Kansas.	
Blaine	5.15 to 5.17.
Frankfort	5.10.
Manhattan	5.15.
Wamego	5.15.
Kentucky.	
Alpha	5.10, violent.
Blandville	About 5.15, very severe.
Bowling Green	Few min. after 5.00.
Canton	5.15.
Earlington	5.10.
Edmonton	5.30.
Falmouth	5.15.
Fords Ferry	5.45, (sun time.)
Franklin	5.09.
Henderson	5.12, very severe.
Paducah	5.12.
Pleasure Ridge P'k	5h 8m 45s.
Princeton	5.08.
Michigan.	
Battle Creek	5.15.
Berrien Springs	4.00 or 5.00.
Grand Rapids	About 5.00.
Hanover	About 5.00.
Kalamazoo	5.10.
South Haven	5.00.
Mississippi.	
Aberdeen	About 5.00.
Austin	5.00.
French Camp	About 5.00.
Fulton	5.00.
Hernando	About 5.00.
Holly Springs	5.15, heavy.
Louisville	About 5.00.
Mayersville	4.45.
Pontotoc	5.00.
Water Valley	5.02.
Missouri.	
Birch Tree	5.10.
Bluffton	5.05.
Edgehill	5.25.
Eight Mile	5.30.

Voluntary observers.	Time—90th meridian.
Missouri—Cont'd.	
Fayette	5.15.
Fulton	5.00.
Gayoso	About 5.00.
Glasgow	5.13.†
Gordonsville	5.15.
Half Way	4.00.
Hermann	5.12.
Houston	About 5.20.
Houstonia	5.13—5.15.
Ironton	5.15.
Kidder	5.10.
Lamonte	5.15.
Lebanon	5.15.
Lexington	5.14.
Liberty	Few min. before 5.14
McCune Station	5.12.
Marcelline	5.00.
Maryville	5.15.
Mexico	5.10.
Mine La Motte	5.05.
New Haven	5.15.
New Madrid	5.14, heaviest since 1811.
New Palestine	About 5.00.
Oakfield	5.15.
Oak Ridge	4.00.
Oregon	5.00.
Do	5.15.
Palmyra	5.15.
Poplar Bluff	5.10.
Potosi	5.10.
St. Charles	5.14.
Shelbina	5.15.
Sikeston	5.05.
Steffenville	5.10.
Trenton	5.10 to 5.15.
Unionville	5.10 to 5.13.
Vermont	5.10.
Vilas	5.20.
Virgil City	About 5.00.
Warrensburg	3.00 and 5.00.
Warrenton	5.08 to 5.09.
Willow Springs	5.00.
Zeitonia	5.00.
Nebraska	
Burchard	5.07.
North Carolina.	
Lenoir	About 5.00.
Skyuka	Between 5.00 & 6.00.
Waynesville	About 5.10.
Ohio.	
Bellefontaine	About 5.15.
Camp Dennison	5.10.
Cleveland	About 5.15.
Dupont	5.15.
Fayetteville	5.00.
Greenville	Between 4.00 & 5.00.
Hanging Rock	5.15.
Hillsboro	Little aft. 5.00.
Leipsic	5.26.
McConnellsville	5.00.
Montpelier	About 5.12.
New Bremen	5.30.
New Paris	5.00.
Ottawa	5.20.
Portsmouth	5.12.
Vanceburg	5.15.
Van Wert	5.05.
Waverly	5.12.
Oklahoma.	
Pond Creek	In the a. m., slight.
Tennessee.	
Ashwood	5.20.
Bolivar	5.15.
Covington	About 5.00.
Dyersburg	5.08.
Franklin	5.15.
Hohenwald	About 5.00.
McKenzie	5.10.
McMinnville	5.11.
Milan	5.09 to 5.10.
Mount Carmel	About 5.00.
Palmetto	4.00.
Riddleton	Between 4.00 & 5.00.
Sewanee	About 4.00.
Trenton	5.15.
Wisconsin.	
De Pere	5.15.

*As recorded on the thermograph sheet. †The Observer, C. W. Pritchett, is director of the Morrison Observatory at Glasgow.

PHOTOGRAPHING LIGHTNING BY DAYLIGHT.

By A. J. HENRY Chief of Division of Records and Meteorological Data (dated January, 1896).

It is a common observation by those who have closely watched lightning flashes of the linear zigzag type that the flash sometimes appears to repeat itself in substantially the same path, or to pour forth a continuous stream from cloud to earth for an appreciable time. As long ago as 1835 Dove satisfied himself that single flashes of lightning often consisted of a number of apparently instantaneous discharges. Frequent attempts have been made, principally by Prof. Rood, by the aid of a revolving disk with colored or numbered sectors, to determine the duration of flashes of the several types. The duration of the complete act has been found to vary from less than $\frac{1}{1600}$ of a second to a whole second, although the individual flashes occupy but a few thousandths of a second.

Photographs of lightning flashes have been made by many persons during the night time, but, so far as known, a flash has never been photographed during daylight hours. Considering that flashes of the multiple-discharge character continue for an appreciable time, it has often occurred to me that under favorable conditions it would be possible to make a negative of a flash of this character.

On September 19, 1895, the conditions long looked for occurred. The heavens were completely overcast, and although it was about 2 o'clock in the afternoon, the actinic power of the light was so reduced that it was possible to expose a sensitive plate of a slow emulsion for half a second with full aperture of the lens without seriously "fogging" it.

The camera was pointed toward that particular point of the heavens whence a flash was expected, the dark slide drawn, and, the moment a flash appeared visible in the field of view, the shutter was opened by the observer and held open possibly for a quarter of a second or longer. Four plates were thus successively exposed, three without results, but on the fourth trial a flash was obtained.

The image secured was sharp and distinct, but the remainder of the plate was of such density that it would be exceedingly difficult to reproduce the flash satisfactorily by means of the half-tone process.

The negative shows four distinct flashes, while a fifth is faintly visible. These, no doubt, are only a portion of the whole number of separate and successive discharges included in the complete act. The total duration of the successive discharges, as estimated by the unaided vision, was not far from two-fifths of a second.

The most striking feature of the flash is the width of the path of discharge. A comparison of the size of the image with that of the Washington Monument in the same field of view, and whose dimensions are known, enables us to determine with a fair measure of accuracy the angular width of the flash. The only uncertainty as to its linear dimensions arises from the fact that the distance of the flash from the camera is not known. If it occurred at the same distance as the Monument, the width of the bottom portion of the path of discharge would be about 20 feet. It is believed, however, that the flash was at some distance beyond the plane of the Monument, and that the width given above is too small.

NOTES BY THE EDITOR.

THE GREAT STORM OF OCTOBER, 1896, IN THE GULF OF CALIFORNIA.

About midnight of September 30 a hurricane wind began at La Paz, at the lower end of the Peninsula of California, and continued until 5 p. m. of October 1. This storm totally destroyed the city, and did much damage to the shipping. Reports from Guaymas, Mexico, state that the hurricane moved slowly northward during four days, September 30 to

October 3, prostrating telegraph lines, and doing great damage to property and shipping.

At Topolobampo all buildings were greatly damaged. The Ahomy River overflowed its banks.

The State of Sinaloa lost the entire sugar-cane crop, and so also the State of Sonora.

The town of Culiacan, the capital of Sinaloa, on the interior plateau, experienced a cloudburst, and was greatly injured. The tremendous rain on the ridge of high mountains back of the city filled the canyons and descended thence to the plateau with a fierceness never before known in that part of Mexico.

At Mazatlan many residences were damaged.

At La Paz the storm and tide combined to raise the waters in the bay to an unprecedented height, flooding the lower part of the city.

The steamer *Progreso* met the storm in the open ocean. She left San Francisco for Panama on September 24. Her course was a little farther off shore than that followed by the Pacific mail boats, and she was in rather light trim, therefore set rather high out of water. On the fifth day out, after strange barometric changes and a gale of wind, the hurricane burst upon the steamer from the southeast, but veered rapidly to the northwest. As the waves were growing higher and higher, and although there was but little daylight under the storm cloud yet a monster wave could be made out coming toward the vessel. Fortunately the *Progreso* was then headed bow on, and the wave passed clear over the bridge and the tops of the mid-ship houses, and over the whole length of the vessel, leaving a complete wreck of the deck, but without otherwise injuring the vessel.

The map of September 30 shows that on that date two well defined areas of low pressure existed; one on the Pacific coast of Mexico, and the other in the West Indian Region. As has been frequently stated in the WEATHER REVIEW, in our chapters on Atlantic meteorology, the equatorial belt of low pressure has a well-marked branch extending northward into the Gulf of California, and the general boundary of the equatorial trough is subject to very decided fluctuations both in the Atlantic and Pacific oceans. Special areas of low pressure with attending cyclonic winds become isolated from the equatorial trough, and move northward as hurricanes. These undoubtedly originate in a favorable combination of inflowing winds and the formation of areas of extended cloud and rain. The process is entirely similar to that which occurs in more northerly latitudes, when, as we have often pointed out, an elongated meiobar becomes converted into one or more well-defined whirls and storm centers. The track of the so-called La Paz hurricane can not yet be defined with sufficient accuracy to justify inserting it on Chart I, but it undoubtedly moved north or north-northeast into the Gulf of California, and broke up in that region on the 3d or 4th of October, while the West Indian hurricane (low area No. 1), moved from the neighborhood of Cuba north-northeast toward Hatteras. Pressure was lowest at Yuma on the 3d, and a trough of depression extended from that region northward into Alberta. A small number of hurricane tracks, ending on the Pacific coast of Mexico and California, were plotted by Redfield and others many years ago, and but little definite knowledge concerning them has been added since then. The Editor hopes soon to be able to publish a report from Weather Bureau officials at San Francisco giving a full account and track of the La Paz hurricane.

TIME RECKONING.

Some efforts that have been made to deduce very accurate results from the reports of the voluntary observers have impressed the Editor with the necessity of urging upon all observers the importance of paying close attention to the whole question of accurate time. Thus, one observer in filling up the statement of "time used on this report,' replies "ten minutes," whereas that statement is intended to call for the standard of time used by him in timing his observations and not for the quantity of time occupied by him in making out his forms. In order to compare together intelligibly observations of thunderstorms, tornadoes, hail, and other phenomena, it is necessary that the records should be kept according to some one of the several standards used by the railroad and telegraph companies of this country; that is to say, the time used in the reports should be that proper to the seventy-fifth, the ninetieth, the one hundred and fifth, or the one hundred and twentieth meridian of longitude west of Greenwich, choosing by preference the meridian that is adopted by the railroad or telegraph station in the observer's neighborhood. There are, of course, many townships so far removed from railroad and telegraph lines that these standards of time are not easily obtained, and in such places there may be some excuse for using the time proper to the local meridian. Such usage is not desirable but, if allowed, the observer should state distinctly how he obtains this local time, and should write the words "local mean time" on every report that he makes, or else he should convert his observed times into some standard hour meridian time, and use that only on his forms. Out of four hundred reports of a recent event there were at least five good observations expressed in local mean time, although the form stated that they were made in standard time; there were about twenty that were stated to be in local time but that were really in standard time of the seventy-fifth meridian; there were about thirty that were expressed in standard time of the ninetieth meridian, although the report said standard time of the seventy-fifth meridian. By far the best rule for all voluntary observers is to adhere as closely as possible to the standard of time shown by the clock at the railroad station that they are accustomed to visit, no matter whether this is the time used by others in their locality or not. Use this only on the forms and reports of observations, and state distinctly whether it is central, eastern, mountain, or Pacific standard.

A number of observers have reported the times used by them as "sun time," but this means nothing definite, as all kinds of popular times are regulated by the sun. Some use a noonday mark or a sun-dial without correcting for the equation of time and are thus actually using what is properly called the "apparent solar time proper to their local meridian." Others use the sun-dial but apply the correction for the equation of time and thus keep their clocks regulated to the "mean solar time of the local meridian." Others use the standard noonday signals that are telegraphed from Washington all over the country, and thus keep their clocks regulated to the mean time that belongs to some one of the recognized standard meridians (sixtieth, seventy-fifth, ninetieth, one hundred and fifth, one hundred and twentieth, etc.) All these are true *sun* times, and observers who have been accustomed to enter the words "sun" time on their forms should explain more definitely what is meant and how they determine their sun time.

As regards the regular observers of the Weather Bureau it is only necessary to add that their official instructions require that all reports to the Central Office be made uniformly in the standard time of the seventy-fifth meridian.

In conformity with the usage of the Bureau the times mentioned in the WEATHER REVIEW will be those of the seventy-fifth meridian, namely, the official standard at Washington, unless specifically stated to the contrary.

EARTHQUAKE AT SEA.

Captain Myer, of the ship *John C. Potter*, arrived at San Francisco, about October 26 and reports: "October 24, N.

43° 54′, W. 128° 32′, experienced a severe shock of earthquake lasting twenty-five seconds. It made the ship shake as if it had jumped over a coral reef in a heavy swell. Every man on board felt the shake, which seems to have occurred just before dinner time, and everything movable on deck started."

GALE AT BUENOS AYRES.

By cable dispatch on October 31, we learn that a great gale was then raging at Buenos Ayres on the coast of Argentina.

SAND BLIZZARD.

During the 18th, 19th, and 20th of October sand and dust storms, with low temperature and the wind at 50 miles per hour, prevailed over Minnesota, the Dakotas, and Manitoba, and the inconveniences of such a blizzard were intensified by the alkaline character of the dust. Numerous prairie fires occurred in southwestern Minnesota and South Dakota, but especially on either side of the Red River Valley.

DROUGHTS AND CROPS.

An article in the Monthly Review of the Iowa Service states that the average deficiency in rainfall for the whole of the State, from March to September, inclusive, was 3.51, and the total rainfall for the seven months, 21.82, and that, although this has been a droughty season, yet this rainfall was sufficient to—

Bring the most abundant crops harvested in this State for the past twenty years; and this, too, following the worst drought experienced in this State since its early settlement.

The records for the season do not furnish a basis for some of the theories that have been so confidently broached to account for the recent widespread drought. It will be observed that the Lake Region and Atlantic Coast stations suffered more than some of the western sections that have very little timber or water surface.

Evidently the notion that lakes, ponds, marshes, and forests are essential to the production of rainfall is not supported by the records of the current year.

THE DROUGHT AND THE WEATHER IN DISTANT REGIONS.

In connection with the drought of 1895 in the United States, the following items relative to other countries are quoted from newspaper reports:

British Columbia.—The Columbia River is lower than ever before known. The woods bordering on Puget Sound are very dry and suffering from forest fires. In some regions but one or two showers have fallen during July, August, September, and October.

Alaska.—The rain and cloudiness has been about normal during August and September in the southern part of the Territory.

Europe.—A drought has prevailed similar to that in the United States.

Australia.—A very severe drought and great distress during July, August, and September, especially in New South Wales.

Greenland.—The summer of 1895 was the mildest ever known in the neighborhood of Ivigtut. The mountains for the first time ever known were bare of ice and snow. Wild animals accustomed to the extreme cold have been compelled to go farther north. Blueberries were plentiful for the first time in many years. The water about the southern coasts was warm enough to bathe in and apparently not colder than on the Jersey coast. [According to reports brought by the arrival, on October 13, at Philadelphia, Pa., of the bark *Silicon* from Ivigtut.]

By the end of October the United States had realized one of the longest and most extensive droughts on record. The States of West Virginia, Kentucky, southern Ohio, and western Pennsylvania had suffered more than any other region. Rains had fallen sufficiently to secure good crops in a portion of eastern Ohio and portions of Arkansas, Indiana, Iowa and Nebraska, Missouri and Kansas, but in general, throughout the watershed of the Mississippi and its tributaries, the drought of August, September, and October has been very severe. On the Atlantic Coast the total rainfall during this growing season has also been small, but as the crops depend upon the proper distribution of the rain throughout the season, the effect of the drought has not always been so disastrous as it might have been. The general rains of the Middle States and New England interrupted the drought in that region during the third week of October, but did not supply water to the western slopes of the Alleghanies in sufficient quantity to improve the navigation of the Ohio, which, at that time, was little better than a succession of pools. In eastern Pennsylvania the drought was considered as the most severe since 1869. On the 19th Capt. E. P. Chancellor, Supervising Inspector, reported that the Ohio River from Pittsburg to Cincinnati was lower than he had ever known it, and could be waded anywhere above Cincinnati. On the eastern side of the Alleghanies, the Potomac River, and especially the Chesapeake and Ohio Canal, were lower than ever before recorded. At Cumberland, October 11, below the dam, the bed of the river was perfectly dry from shore to shore, and there was not enough depth of water in the intake lock of the canal basin to float an empty boat. Navigation was closed until the water should rise.

At Portsmouth, Ohio, the lowest watermark at the close of October, 1895, was 2 inches below that of 1881, but not yet down to that of 1838. A special correspondent of The Evening Star, writing from Gallipolis, Ohio, November 7, states that over four or five counties in the extreme southern part of Ohio and on occasional trips into West Virginia and Kentucky he found the same condition everywhere. No rainfall since the snows of February; the effects of the drought were already felt in May, and by the first of June farmers were full of fear. Notwithstanding this, both wheat and corn gave good crops, and on the bottom lands crops were of the finest quality. Potatoes, oats, and hay gave light crops, but the apple crop was the best ever known. July, August, and September were exceedingly hot, and up to this time there had not been a single heavy rain that would wet the soil to the depth of an inch. Local showers, of very limited area and short duration, had occurred at rare intervals. People commonly said "the showers have all been going around us all summer; they had a good rain north or south of us, but we had not a drop." Very often the correspondent had a chance to test such reports, and generally found them erroneous; each locality considered itself an exceptional sufferer; but his wider observation showed that there was very little partiality in the distribution of those showers, except that they were a little more frequent and copious near the river. At Uniontown, Ky., the Ohio was so low that it is said that an old vein of coal under the river bed was worked and thousands of bushels taken out daily. Possibly, however, this was a partial error. The coal may have been dug out at Uniontown very much as it was at Milton, Ky., where the wrecks of old coal barges were uncovered and tons of coal taken out by the farmers.

A correspondent of the New York World asks—

What has become of the enormous quantity of water that has evaporated from the United States during this drought which has lasted so long that the Great Lakes have been sensibly lowered and large rivers have shrunk to mere brooks. The water is somewhere in the world, and is in reach of the telegraph and international mail service. There must have been a marked change of rainfall somewhere to correspond with our loss of water; can not the Weather Bureau find what has become of it?

This correspondent starts an interesting question, to which we must reply that it can not be definitely answered unless we have a series of daily maps of the weather, or monthly maps of average conditions for the whole globe. Notwithstanding the activity of modern weather bureaus, we have at present daily and monthly maps of only the United States, Canada, Europe, Algeria, Cape Colony, India, Japan, and Australia. The total area covered by these countries is but a small fraction of the globe, and our maps of the great oceanic areas are only compiled after years of labor in collecting the logs of vessels. If daily maps of the globe were available, we should, undoubtedly, be able to demonstrate that which at present we only have a right to suspect as the

true state of the case. The rainfall that has been withheld from the United States represents but an utterly insignificant fraction of the total quantity of moisture in the atmosphere, and its retention in the air can have but little effect on the phenomena that may have occurred elsewhere. If, as is most probable, the moisture is fairly well distributed throughout the atmosphere, it will not be practicable with our present knowledge to ascertain where that which is withheld from us should descend as rain. In fact, the collection of data relative to weather in distant regions, so far as we have at present progressed, suggests the possibility that droughts have occurred this year in almost all regions from which we have meteorological reports, whence we may conclude that the atmosphere is, on the average, slightly drier than usual, possibly the tenth or the hundredth part of 1 per cent, a conclusion to which, in fact, we were lead by a study of the winds in some editorial remarks on page 337 of the September REVIEW. This conclusion is, in fact, the very opposite of that suggested by our correspondent, whose words imply that there must on the average be the same amount of rainfall annually all over the globe, as a whole, and that, therefore, a diminished rainfall over the United States, together with increased evaporation, necessarily means that the atmosphere has, temporarily, a larger charge of moisture than usual.

If we accept as a working hypothesis the idea that the whole atmosphere can have appreciably less moisture one year than another, we are led then to inquire as to the reason for this. Several reasons may be suggested as equally plausible. The first is purely mechanical, and rests upon the conclusion, which now amounts almost to a demonstration, that the average condition of the atmosphere as a whole may vary from year to year in an irregular way precisely as the annual average condition is known to vary for any given station, and even for large sections of the country. We have no right to assume that the average temperature or moisture, or movement, or pressure of the atmosphere of the whole globe will be the same from year to year any more than that the local station averages will be the same. This is equivalent to recognizing the fact that the atmospheric phenomena do not and can not go through short cycles only, but must necessarily also go through many long cycles, and that none of these are necessarily recurrent. In technical terms we should say that atmospheric phenomena are not a case of steady motion.

A second hypothesis that may be plausibly suggested is that the cause of these irregularities lies outside of the earth, and may be due to the irregularities in the quantities of heat sent to us from the sun from year to year. It has been plausibly argued from the observations of temperature that there is a periodicity in the solar radiation parallel to that of the sun spots, so that the whole atmosphere receives more heat, and consequently must have a little more moisture, and perhaps yield more rains and storms when the sun spots are most numerous. But this hypothesis does not seem to be needed at present.

THE EXTENT OF A LOCAL RAIN.

In continuation of our remarks in the September REVIEW as to the limiting area of what may be called a local storm we append the following table showing the details of the rainfall at Jupiter, Fla., and at Hypoluxo, which is 33 miles south of that station and about the same distance from the seashore. At Jupiter the coast line trends north-northwest and south-southeast, but at Hypoluxo the trend is more nearly north and south. The maximum monthly rainfalls usually occur on this coast in either August or September, but for the present year they have occurred in October, and have been heavier at Jupiter and Hypoluxo than any other region. The following table gives the rainfall, measured daily at 8 a. m. and 8 p. m. at Jupiter, and in the next columns the total rain at each station for the twenty-four hours preceding 8 a. m. of the respective dates. These falls were usually heavier during the twelve hours, 8 p. m. to 8 a. m., than during the daytime; they were almost invariably accompanied by north, east, or northeast winds attending cyclonic disturbances to the eastward. The differences in the 24-hour rainfall up to 8 a. m. of each day, as given in the last columns of this table, show how very local the heavy rainfalls must have been, and how many stations are necessary for the proper presentation of the distribution of heavy rainfall over any country, even a flat and uniform land, like Florida:

Daily Rainfall, October, 1895.

Date.	Jupiter.		8 p. m. + 8 a. m. daily.		Date.	Jupiter.		8 p. m. + 8 a. m. daily.	
	8 a. m.	8 p. m.	Jupiter.	Hypoluxo.		8 a. m.	8 p. m.	Jupiter.	Hypoluxo.
September 30.	.....	0.10	.....	.....	October 17....	0.54	0.03	0.69	0.99
October 1....	0.10	1.72	0.20	0.72	18....	2.97	1.37	3.00	1.00
2....	T.	T.	1.72	0.12	19....	0.48	0.00	1.85	0.94
3....	0.08	0.06	0.08	0.00	20....	0.01	1.84	0.01	3.45
4....	0.02	0.00	0.08	0.00	21....	2.00	0.90	3.84	4.05
5....	0.00	0.00	0.00	0.00	22....	2.30	0.05	3.20	0.00
6....	0.00	0.00	0.00	0.00	23....	0.00	0.00	0.05	0.00
7....	0.00	0.00	0.00	0.00	24....	0.00	0.00	0.00	0.00
8....	0.00	0.00	0.00	0.00	25....	0.00	0.00	0.00	0.00
9....	0.00	0.21	0.00	1.15	26....	0.00	0.00	0.00	0.00
10....	1.84	0.18	2.05	0.04	27....	0.00	0.00	0.00	0.00
11....	0.00	0.00	0.18	0.00	28....	0.00	T.	0.00	7.50
12....	0.18	0.16	0.18	0.33	29....	T.	0.87	T.	1.33
13....	T.	T.	0.16	0.00	30....	0.03	0.01	0.90	0.00
14 ...	0.00	0.00	0.00	0.00	31....	0.00	0.00	0.01	0.00
15....	1.52	0.82	1.52	1.74					
16....	0.58	0.15	1.40	1.08		12.65	8.38	21.13	24.39

OBSERVATIONS AT HONOLULU.

Meteorological observations at Honolulu, Republic of Hawaii, by Curtis J. Lyons, Meteorologist to the Government Survey.

Pressure is corrected for temperature and reduced to sea level, but the gravity correction, —0.06, is still to be applied.

The absolute humidity is expressed in grains of water, per cubic foot, and is the average of four observations daily.

The average direction and force of the wind and the average cloudiness for the whole day are given unless they have varied more than usual, in which case the extremes are given. The scale of wind force is 0 to 10.

The rainfall for twenty-four hours is given as measured at 6 a. m. on the respective dates.

August, 1895.	Pressure at sea level.			Temperature.					Humidity.			Wind.		Cloudiness.	Rain measured at 6 a. m.
	9 a. m.	3 p. m.	9 p. m.	6 a. m.	2 p. m.	9 p. m.	Maximum.	Minimum.	Relative. 9 a. m.	Relative. 9 p. m.	Absolute.	Direction.	Force.		
	Ins.	*Ins.*	*Ins.*	°	°	°	°	°	%	%					*Ins.*
1..	30.00	29.94	29.98	77	82	78	86	77	71	74	7.6	ne.	5-3	8	0.07
2..	29.99	29.94	29.97	78	78	78	78	76	80	79	8.4	ene.	6	10	0.06
3..	30.00	29.95	30.00	78	80	77	81	77	79	77	8.0	ne.	4	10	0.65
4..	30.02	29.95	30.01	77	81	77	84	77	59	70	7.0	ne.	4	8	0.01
5..	30.02	29.97	30.02	76	81	77	84	76	66	71	6.9	ne.	3	3	0.00
6..	30.02	29.97	30.07	75	82	77	85	72	64	74	7.1	ne.	4	3	0.05
7..	30.07	30.00	30.06	76	83	75	85	75	67	80	7.4	ne.	4	3	0.08
8..	30.04	29.97	30.03	76	81	77	82	76	69	70	7.4	ne.	3	4	0.06
9..	30.04	29.98	30.06	75	83	77	85	75	64	70	7.2	ne.	4	4	0.08
10..	30.06	29.99	30.05	74	83	73	86	70	64	74	6.9	ne.	4	4	0.00
11..	30.03	29.96	30.02	75	84	74	85	71	71	74	7.3	ne.	3-0	3	0.00
12..	30.02	29.97	30.00	71	74	76	85	69	67	74	7.2	w-s-e.	1	9-3	0.00
13..	30.02	29.93	29.99	76	82	77	84	74	64	65	6.9	ne.	4	3	0.09
14..	30.00	29.98	30.01	74	82	77	84	72	70	70	6.8	ne.	3	4	0.02
15..	30.00	29.94	30.00	74	82	76	84	72	75	78	7.5	ene.	4	4	0.13
16..	30.04	29.99	30.08	74	82	77	84	74	82	70	7.5	ene.	5	8	0.17
17..	30.09	30.04	30.10	76	82	75	84	76	64	80	7.0	ne.	3	4	0.04
18..	30.11	30.05	30.10	76	80	76	82	73	79	76	7.4	ne.	3	9	0.19
19..	30.10	30.04	30.08	74	79	76	82	73	67	67	6.9	ne.	5	4	0.30
20..	30.10	30.08	30.08	72	78	75	79	71	80	77	7.4	ene.	4	10-7	0.10
21..	30.06	30.00	30.06	74	79	76	82	73	72	74	7.2	ne.	3	5	0.15
22..	30.06	29.99	30.05	72	82	78	84	72	72	75	8.0	ene.	3	5	0.06
23..	30.06	30.00	30.06	72	82	77	85	71	65	74	7.5	ene.	3	4	0.13
24..	30.05	29.97	30.04	75	81	75	84	74	70	77	7.6	nne.	0-4	2	0.01
25..	30.04	29.98	30.04	70	82	76	85	69	69	75	7.7	s-ne.	1-3	2-5	0.11
26..	30.02	29.95	30.02	75	84	75	85	72	65	85	7.5	se-ne.	2	3	0.00
27..	30.01	29.95	30.01	70	83	75	83	70	80	80	8.0	sw-ne.	2	4	0.35
28..	30.02	29.94	30.02	75	84	78	86	71	68	75	7.8	e.	3	4-0	0.06
29..	30.03	29.96	30.04	78	83	78	85	77	68	69	7.4	ene.	3	3	0.00
30..	30.01	29.97	30.04	78	82	77	84	77	68	67	7.1	ne.	3	3	0.00
31..	30.04	29.98	30.04	76	81	78	85	75	65	65	6.7	ne.	4	4	0.00
	30.04	29.97	30.03	74.8	81.2	76.4	83.7	73.4	69.8	74.0	7.6	.....	3.3	4.8	2.87

The monthly summary for August is: Mean temperature, 77.5; the normal is 77.8; extreme temperatures, 86 and 69. Two directions of wind, connected by a dash, indicate change from one to the other; also same for force.

Meteorological observations at Honolulu, Republic of Hawaii, by Curtis J. Lyons, Meteorologist to the Government Survey.

September, 1895.	Pressure at sea level.			Temperature.					Humidty.			Wind.		Cloudiness.	Rain measured at 6 a. m.
									Relative.						
	9 a. m.	3 p. m.	9 p. m.	6 a. m.	2 p. m.	9 p. m.	Maximum.	Minimum.	9 a. m.	9 p. m.	Absolute.	Direction.	Force.		
	Ins.	*Ins.*	*Ins.*	°	°	°	°	°	%	%					*Ins.*
1	30.06	30.00	30.06	76	82	76	84	73	61	74	6.7	ne.	3	3-6	0.04
2	30.05	29.98	30.04	76	81	77	84	74	61	70	7.0	e-ne.	4	4	0.06
3	30.02	29.95	29.98	74	81	76	82	73	72	74	7.3	ne.	3	7	0.13
4	29.99	29.92	29.98	74	81	79	85	73	75	82	8.6	e-ne.	4	5-10	0.08
5	30.04	29.96	30.05	76	81	72	85	75	82	91	8.7	s-n.	1-4-0	10	0.31
6	30.01	29.96	30.01	75	81	77	83	70	67	70	7.1	ne.	4	3-6	1.08
7	30.00	29.95	29.98	73	76	77	79	72	77	70	7.4	ne.	3	6	0.33
8	29.98	29.92	29.98	76	80	77	81	71	68	74	7.4	ne.	6	4	0.41
9	30.06	30.00	30.07	76	82	78	83	75	69	75	7.4	ne.	5	6	0.06
10	30.07	30.00	30.06	74	81	77	82	73	68	72	7.4	ne.	4	5	0.06
11	30.01	29.94	30.02	76	82	76	83	75	60	76	7.1	ne.	4	4	0.02
12	29.99	29.94	30.00	76	81	77	81	73	75	74	7.5	e-ne.	4	5	0.02
13	30.01	29.96	30.04	75	81	75	82	72	72	68	7.2	e-ne.	5	5	0.08
14	30.05	29.98	30.03	74	81	78	83	73	71	69	7.2	ne.	3	3	0.13
15	30.06	29.97	30.05	76	81	78	83	74	68	71	7.2	ne.	3-5	3	0.09
16	30.05	29.98	30.07	75	83	79	84	73	71	71	7.5	ne.	3	2	0.07
17	30.11	30.02	30.08	77	82	78	83	74	68	70	7.4	n-ne.	4	3	0.05
18	30.09	30.03	30.08	77	81	78	82	75	70	68	7.1	ne.	3	8	0.00
19	30.08	29.99	30.07	76	82	77	83	74	64	68	6.9	ne.	4	3	0.11
20	30.06	30.00	30.07	74	80	77	82	71	68	68	7.0	ne.	5	5	0.30
21	30.10	30.01	30.09	75	80	78	82	75	64	68	7.0	ne.	4	3	0.07
22	30.08	30.02	30.10	74	80	77	81	72	68	71	7.1	ne.	5	4	0.32
23	30.08	29.99	30.07	74	80	75	81	72	68	77	7.1	ne.	4	4	0.06
24	30.08	29.97	30.04	74	79	76	81	72	71	74	7.1	ne.	4	4	0.23
25	30.03	29.96	30.03	74	81	77	83	72	68	71	7.2	ne.	3	5	0.07
26	30.03	29.96	30.06	73	79	74	81	70	77	77	7.4	ne.	2	10	0.01
27	30.05	29.96	30.06	69	81	76	82	67	79	74	7.4	ne.	1-3	10-2	0.01
28	30.08	29.98	30.08	71	80	73	81	67	73	77	7.2	n-ne.	2-0	8-2	0.08
29	30.09	29.99	30.07	73	80	76	83	70	68	64	6.6	n-ne.	2	1	0.16
30	30.05	29.95	29.99	72	79	76	81	72	68	70	6.9	n-ne.	3	4	0.00
	30.05	29.98	30.04	74.5	80.6	76.6	82.3	72.4	69.7	72.6	7.3	ne.	3.5	4.7	4.34

Mean temperature: 6+2+9+3 is 77.2; the normal is 77.4; extreme temperatures, 85° and 67°. Two directions of wind, connected by a dash, indicate change from one to the other; also same for force.

LIGHTNING FLASHES BY PAIRS.

In regard to the electric storm of September 17 at Montpellier, Ohio, the observer, Mr. Waterston, states that—

One of the strange features of the lightning was that many of the bolts appeared to descend in pairs, about 10 feet apart. * * * I examined a tree that was struck by lightning, and it looked as though three bolts had come down it. * * * Parties living near by say that one of those double bolts was plainly seen coming down in the direction where the tree stood. Other persons report that where bolts came down and struck the ground several good-sized holes were made.

[NOTE.—It is not uncommon for a lightning flash to divide into several parts as it nears the ground, but these will hardly be called double or triple bolts. It is, however, rare to find the exact spot where a bolt has struck the ground, and if a hole is identified as certainly caused by the lightning, then it will always be interesting to dig down and recover, at least, a fragment of the long fulgurite, or tube, that is apt to be formed by the melting together of the grains of soil by the lightning as it passes downward.]

THE NOR'WESTERS OF CANTERBURY.

In the New Zealand Alpine Journal, Vol. II., No. 8, the editor, Mr. J. T. Meeson, has a paper on the hot, dry winds that blow from the northwest across the mountains and over the eastern plains of both islands, and are felt in their greatest intensity in the Province of Canterbury, in the South Island. The following abstract is from the Bulletin of the American Geographical Society, Vol. XXVII, p. 409:

These winds are most frequent in the late spring and summer, from October to March, with their greatest strength perhaps in February at the time of the wheat harvest. The "nor'wester" comes on as follows: The wind blows for two or three days from the northeast and then dies away, or veers to the north; light, cirrus clouds drift in the upper sky from the northwest; the barometer falls, sometimes very fast, and the thermometer rises. A few hours of delicious weather succeed, and then, within twenty-four hours or less, comes the northwest wind, gentle at first, and even cool, with an occasional warm puff. A beautiful arch of cumulus clouds stretches across the heavens from the north to the west or southwest, and below it the sky is of a peculiar, soft blue. The arch sometimes remains through the storm, sometimes it is dissipated in a few hours. The force of wind increases to a gale, with clouds of dust and a stifling heat. Vegetation droops and withers, and human beings suffer with lassitude, headache, and neuralgia. The mountains to the west are covered with black clouds—*the true fœhn wall*—and heavy rain falls there.

This state of things lasts sometimes for days, sometimes for a few hours, when the wind veers to the west, the barometer rises, the thermometer falls, and a cold southwest wind sets in for a time, and often the process begins again. Mr. Meeson regards this hot wind as a true *fœhn*, and he accounts for it in this way: The northwest wind, charged with moisture, strikes the west coast at a temperature of 60° F. By the time it reaches the tops of the mountains, at 9,000 feet, it loses 30° of heat, while in descending the eastern side of the mountains it gains 50°, and reaches the Canterbury plains as a dry wind, with a temperature of 80° F. To this temperature is added the heat always developed in front of a cyclone.

The "nor'wester" is, on the whole, a beneficial agent. Some persons hold that it is essential to the maturity of the wheat crop; it kills or blows away the germs of disease, purifies the atmosphere, melts the snows, and plays a great part in the development of animal and vegetable life.

THE MOVEMENT OF THUNDERSTORMS AGAINST THE WIND.

The following contribution to this subject is sent by Mr. Fred. W. Rausch, now living at Topeka, Kans., in a letter dated January 20, 1896:

In regard to the phenomenon reported by Mr. E. D. Hicks in the April REVIEW, page 131, I would say that I have often observed the same in western Missouri, eastern and south central Kansas, but more so during my eight years' residence in eastern Colorado. In Colorado thunderclouds would almost always move in a southeast direction [i. e., from northwest to southeast.—C. A.]. As nearly all our rain during summer in southeast Colorado fell from thunderclouds, I gave the same particular attention. The clouds would form apparently above the mountains during the day, and in the evening break away to the southeast. If the wind was strong from the east or southeast the same would form in a solid black bank; otherwise, float off apart; in either case with more or less rain. The longer the wind would hold out against the cloud the heavier the rain. If the wind changed in the northwest in advance of the cloud, we received mostly wind. When the clouds came from the southwest against the wind, we seldom received rain in paying quantities; the same would appear to roll over one another, and where accompanied by a gale of wind the rain would do more harm than good, causing the dust to settle on the side exposed to the rain and to form a coat of mud. We called these dry rains. Side views of the falling rains traveling against the wind would show a front like this, and sometimes [The sketches are omitted; they simply show the curved streaks of falling rain stretching from the rain cloud to the ground, the convex side of the streak being on the side toward which the wind is blowing and the cloud moving. Sometimes such streaks have a double curvature, indicating two or more layers of wind from different directions.—C. A.], the wind seeming to be the strongest at the curve of the rain streak. Such rains would never last long, but were quite heavy. After the clouds were over [passed overhead] the wind would for a time return to the southeast and often blow the rain back when it was clear overhead; in fact, the wind would spread from the cloud in all directions, but always traveling with the cloud as the same passed over.

On the same subject Mr. W. D. Bruner, Weather Bureau Observer at Mobile, Ala., under date of January 21, 1896, writes:

In reference to the interesting "Notes by the Editor" in the April and August (1895) numbers of the MONTHLY WEATHER REVIEW, under the heading "Do thunderstorms advance against the wind?" I wish to offer the following remarks, which will, perhaps, serve as an explanation. Having led a pastoral life on the western plains I have frequently remarked the phenomena mentioned.

The thunderstorms of the western plains are, perhaps, not unlike those of any other part of the country, but the topography of the country, absence of trees, etc., facilitate the wide range of observation. These storms usually move from a westerly direction, dissipating in their easterly movement, and for short periods are noted for violence and energy. They have a limited rainfall area which is confined to the path of the storm. The storms are generally preceded by a stratum of high cirrus clouds, followed by dark stratus and nimbus clouds, boiling and seething with the conflicting air currents, often presenting a picture of grandeur seldom equaled. As the storm nears the point of observation the wind freshens toward the storm, but a calm prevails for a short period as the nimbus cloud approaches.

The wind veers or backs immediately when the rain begins, and blows from the opposite direction, with increasing force and falling temperature. The wind from any point around the storm blows toward the center, conforming to the general law, consequently any direction of movement taken by the storm would be against the wind.

Rainfall does not result from this opposition of the storm movement and the wind direction. It is a fact that points on either side of the the storm path are not favored with rain, not because there is no opposition between the wind and storm, but because the rain area is small and confined to the storm path.

Rain may continue to fall for a short time after the storm center has passed with the wind blowing with the storm movement, but these storms usually move suddenly or dissipate rapidly, giving place to a clearing sky, light, variable winds and rising temperature.

CLIMATE AND CROP SERVICES.

In 1874 the system of voluntary meteorological observers, that had for many years been maintained by the fostering care of the Smithsonian Institution, was officially turned over to the Chief Signal Officer of the Army, and in 1891 it became an integral part of the Weather Bureau of the Department of Agriculture. In 1881 a circular letter was sent to the governors of States recommending the organization of State weather services under the proper State official and the appropriation of money for the necessary expenses. Since that date several States have taken the necessary action, and in some other States the work has been provided for by special local interests, but the great burden of expense still devolves upon the Weather Bureau. In order to encourage this important work the successive Chiefs of the Weather Bureau have assigned experienced observers to assist in the respective States, and in many cases the work that is done by these officers and the voluntary observers far exceeds that done by the State officials. Moreover, an undesirable diversity has developed in the methods and style of publication and the distribution of the climatological data.

In order to remedy these difficulties and bring about a more equable division of responsibilities the Chief of the Weather Bureau has issued "Instructions No. 18," dated January 30, 1896, from which we make the following extracts:

1. The State Weather Service Division of the Central Office will hereafter be known as "Climate and Crop Division," and the latter designation is hereby officially adopted.

It is desired to emphasize the distinction between "climate" and "weather." The term "climate" refers especially to seasonal meteorological conditions and to the variations between places in their average meteorological features. The work of voluntary observers and crop correspondents has to do almost entirely with "climate" and not with "weather," which latter term refers more especially to the drift of changing air conditions from day to day. The weather-crop bulletins of the Weather Bureau will hereafter bear the following caption:

U. S. DEPARTMENT OF AGRICULTURE.

CLIMATE AND CROP BULLETIN OF THE WEATHER BUREAU.

The attention of directors of State Weather Services, supported wholly or in part by State funds and cooperating with the Weather Bureau, is respectfully called to the advisability of changing the titles of their services so as to omit the word "weather." Probably something like the following designation would be acceptable: "Ohio Climate and Crop Service."

Services wholly supported by funds from the Department of Agriculture will not, after March 1, 1896, be termed "State Weather Services." Such designation is misleading and manifestly improper, as the States have nothing to do with their maintenance.

The following caption for letters, crop bulletins, and monthly meteorological tables will be adopted, and will clearly indicate the status of these services:

U. S. DEPARTMENT OF AGRICULTURE.

CLIMATE AND CROP SERVICE OF THE WEATHER BUREAU.

ILLINOIS SECTION.

C. E. LINNEY, Section Director. CHICAGO, ILL.

The necessary change may go into effect at once where possible, but it must not be delayed longer than March 1st, next.

Where the meteorological tables are printed in journals supported by private means care will be exercised not to designate such journals as "official."

All observers and other officials of the Weather Bureau are forbidden to approach State legislators or committees of State legislatures for the purpose of inducing them to appropriate public funds to be used in State Weather Service work, or for other purposes. They may appear before the proper committees for the purpose of explaining the need of such appropriation, if invited by the proper State officials, but in no way will they solicit legislative action in the interest of their work. The work of the Climate and Crop Service of the Weather Bureau should be extended along all proper lines, so as to meet the needs of the people as fully as the resources of the national service will permit.

If legislatures desire to appropriate funds for the purpose of cooperating with the national service in still further extending its benefits to their States, that matter must be left to the determination of such legislatures, without solicitation on the part of any Weather Bureau employee.

It is hoped soon to perfect printing appliances so that each Section of the Climate and Crop Service of the Weather Bureau may be able to print its own daily weather maps, crop bulletins, and monthly publications, and that the long-sought object of issuing uniform publications may at last be realized. If this is accomplished, it is intended to set apart proper space for text or editorial notes, so that the individuality of the official at the head of the Section may be fully recognized.

METEOROLOGICAL TABLES.

By A. J. HENRY, Chief of Division of Records and Meteorological Data.

Table I gives, for about 130 Weather Bureau stations making two observations daily and for about 20 others making only the 8 p. m. observation, the data ordinarily needed for climatological studies, viz, the monthly mean pressure, the monthly means and extremes of temperature, the average conditions as to moisture, cloudiness, movement of the wind, and the departures from normals in the case of pressure, temperature, and precipitation.

Table II gives, for about 2,400 stations occupied by voluntary observers, the extreme maximum and minimum temperatures, the mean temperature deduced from the average of all the daily maxima and minima, or other readings, as indicated by the numeral following the name of the station; the total monthly precipitation, and the total depth in inches of any snow that may have fallen. When the spaces in the snow column are left blank it indicates that no snow has fallen, but when it is possible that there may have been snow of which no record has been made, that fact is indicated by leaders, thus (....).

Table III gives, for about 30 Canadian stations, the mean pressure, mean temperature, total precipitation, prevailing wind, and the respective departures from normal values. Reports from Newfoundland and Bermuda are included in this table for convenience of tabulation.

Table IV gives, for 29 stations, the mean hourly temperatures deduced from thermographs of the pattern described and figured in the Report of the Chief of the Weather Bureau, 1891–'92, p. 29.

Table V gives, for 28 stations, the mean hourly pressures as automatically registered by Richard barographs, except for Washington, D. C., where Foreman's barograph is in use. Both instruments are described in the Report of the Chief of the Weather Bureau, 1891–'92, pp. 26 and 30.

Table VI gives, for 136 stations, the arithmetical means of the hourly movements of the wind ending with the respective

hours, as registered automatically by the Robinson anemometer, in conjunction with an electrical recording mechanism, described and illustrated in the Report of the Chief of the Weather Bureau, 1891–'92, p. 19.

Table VII gives the danger points, the highest, lowest, and mean stages of water in the rivers at cities and towns on the principal rivers; also the distance of the station from the river mouth along the river channel.

Table VIII gives the maximum, minimum, and mean readings of the wet-bulb thermometer for 135 stations, as determined by observations of the whirled psychrometer at 8 a. m. and 8 p. m., daily.

The difference between mean local time and seventy-fifth meridian time is also given in the table.

Table IX gives, for all stations that make observations at 8 a. m. and 8 p. m., the four component directions and the resultant directions based on these two observations only and without considering the velocity of the wind. The total movement for the whole month, as read from the dial of the Robinson anemometer, is given for each station in Table I. By adding the four components for the stations comprised in any geographical division one may obtain the average resultant direction for that division.

Table X gives the total number of stations in each State from which meteorological reports of any kind have been received, and the number of such stations reporting thunderstorms (T) and auroras (A) on each day of the current month.

Table XI gives, for 38 stations, the percentages of hourly sunshine as derived from the automatic records made by two essentially different types of instruments, designated, respectively, the thermometric recorder and the photographic recorder. The kind of instrument used at each station is indicated in the table by the letter T or P in the column following the name of the station.

Table XII gives the records of hourly precipitation as reported by stations equipped with automatic gauges, of which 37 are known as float gauges and 7 as weighing rain and snow gauges.

Table XIII gives the record of excessive precipitation at all stations from which reports are received.

Table XIV gives a record of the heaviest rainfalls for periods of five and ten minutes and one hour, as reported by regular stations of the Weather Bureau furnished with self-registering rain gauges.

Additional information concerning the tables will be found in the January, 1895, REVIEW.

TABLE I.—*Climatological data for Weather Bureau Stations, October*, 1895.

Stations.	Elevation above sea-level, feet.	Length of record, years.	Pressure in inches.			Temperature of the air, in degrees Fahrenheit.										Humidity and precipitation.					Wind.					Clear days.	Partly cloudy days.	Cloudy days.	Average cloudiness, tenths.	Monthly temperature data since opening station.			
			Mean pressure, 8 a. m. and 8 p. m. +2.	Mean reduced.	Departure from normal.	Mean max. and min. +2.	Departure from normal.	Maximum.	Date.	Mean maximum.	Minimum.	Date.	Mean minimum.	Greatest daily range.	Mean temperature of the dew-point.	Mean relative humidity, per cent.	Precipitation, in inches.	Departure from normal.	Days with .01, or more.	Total movement, miles.	Prevailing direction.	Maximum velocity. Miles per hour.	Maximum velocity. Direction.	Maximum velocity. Date.					Absolute maximum.	Year.	Absolute minimum.	Year.
New England.						43.3	— 2.5										2.90	— 1.3														
Eastport	76	23	29.89	29.98	— .03	44.7	— 1.6	69	7	51	29	18	39	22	36	72	1.15	— 3.5	12	8,863	s.	44	e.	13	2	30	9	6.4	80	1879	24	1891
Portland, Me	103	24	29.88	29.98	— .06	46.3	— 0.8	68	6	54	27	31	38	26	37	74	1.91	— 2.1	7	6,328	nw.	32	nw.	14	8	15	8	5.6	83	*	26	1889
Northfield	872	9	29.07	30.03	— .01	41.2	— 2.9	67	19	52	15	31	31	38	31	73	0.45	— 2.3	7	7,349	s.	37	nw.	18	8	12	11	5.8	83	1891	12	1889
Boston	135	25	29.89	30.05	— .03	49.6	— 1.9	70	28	58	32	31	41	26	39	70	6.19	+ 1.9	8	8,953	nw.	46	ne.	13	12	11	8	4.6	90	1881	25	1879
Nantucket	14	9	30.01	30.02	— .06	51.6	— 2.2	66	*	57	37	22	46	18	42	69	1.91	— 3.1	5	9,337	ne.	42	s.	13	13	9	9	5.3	70	1890	35	1888
Woods Hole	.....	18	.....	.....	.....	50.6	— 3.0	66	8	56	34	31	46	18	.....	.....	2.90	— 0.9	8	12,607	w.	48	nw.	14	19	6	6	3.2	77	1879	31	1891
Vineyard Haven	.....	9	.....	.....	.....	52.0	— 1.1	69	*	59	34	22	45	23	.....	.....	2.45	— 1.8	6	.....	sw.	.....	.....	.....	14	7	10	....	80	1890	32	1891
Block Island	37	16	30.01	30.04	— .07	50.8	— 3.5	65	8	56	36	22	45	21	42	72	4.62	+ 0.3	8	11,872	nw.	48	se.	31	10	17	4	4.9	75	1881	33	1884
Narragansett Pier	.....	14	.....	.....	.....	47.9	— 4.4	68	3	57	26	22	39	28	.....	.....	4.15	— 0.4	7	.....	sw.	.....	.....	.....	18	5	8	....	79	1884	25	*
New Haven	107	23	29.91	30.06	— .05	48.6	— 3.7	69	3	58	26	22	40	31	38	69	3.32	— 0.8	7	7,491	nw.	38	n.	31	17	8	6	5.8	86	1881	34	1879
Mid. Atlan. States.						52.6	— 4.2										2.45	— 0.9														
Albany	85	22	29.96	30.05	— .02	47.4	— 3.9	68	2	56	28	31	39	28	38	75	2.35	— 1.2	6	6,234	s.	38	s.	22	12	12	7	5.0	86	1891	23	1876
New York	314	25	29.71	30.05	— .04	51.0	— 5.0	71	3	59	34	30	44	21	40	70	4.04	+ 0.6	6	10,922	nw.	48	w.	28	18	5	8	3.6	88	*	31	1876
Harrisburg	377	8	29.67	30.09	+ .03	49.6	— 2.9	72	19	60	29	29	40	35	37	66	1.63	— 1.6	5	5,124	w.	33	w.	28	22	6	3	2.4	85	1891	28	1893
Philadelphia	117	25	29.96	30.06	— .05	52.6	— 4.0	74	3	61	34	30	44	29	38	61	2.97	0.0	4	7,999	nw.	35	nw.	13	21	5	5	3.1	87	*	31	*
New Brunswick	.....	9	.....	.....	.....	49.3	— 3.2	73	3	62	25	22	37	41	.....	.....	3.69	+ 0.4	5	.....	nw.	.....	.....	.....	11	15	5	....	88	1891	24	1893
Baltimore	142	25	29.92	30.07	— .04	53.4	— 4.6	74	*	63	34	29	44	35	36	56	2.20	— 0.9	4	5,645	n.	35	nw.	13	23	6	2	2.4	89	*	30	*
Washington	112	25	29.97	30.09	— .03	52.1	— 5.2	74	19	63	29	24	41	41	37	64	1.94	— 1.3	4	5,292	nw.	34	nw.	13	25	4	2	1.6	92	*	26	*
Cape Henry	.....	22	.....	.....	.....	58.5	— 4.5	79	7	66	42	11	51	25	.....	.....	2.13	— 1.6	4	.....	ne.	.....	.....	.....	8	12	11	....	89	*	35	1891
Lynchburg	695	25	29.37	30.12	+ .01	53.5	— 4.8	77	19	67	29	11	40	39	38	62	1.56	— 1.8	4	2,989	nw.	25	nw.	12	22	7	2	2.0	91	1884	28	1879
Norfolk	57	25	30.03	30.09	— .02	58.6	— 3.4	76	27	67	42	21	50	28	45	67	1.99	— 1.9	3	6,580	ne.	36	nw.	13	19	8	4	3.2	89	1884	31	1876
S. Atlantic States.						62.4	— 2.8										1.45	— 2.7														
Charlotte	773	16	29.28	30.10	— .01	58.2	— 2.8	80	7	70	34	10	47	31	36	51	0.79	— 3.0	3	4,952	ne.	25	sw.	27	19	9	3	3.1	92	1884	30	1879
Hatteras	11	15	30.07	30.08	— .01	62.2	— 3.1	78	7	67	49	*	57	18	54	76	2.84	— 3.6	4	11,634	ne.	48	n.	4	12	12	7	4.6	90	1881	42	1887
Kittyhawk	9	20	30.04	30.05	— .01	60.2	— 4.2	79	7	66	45	25	55	21	51	74	2.15	— 1.6	4	13,222	ne.	52	ne.	4	17	6	8	4.1	90	1881	38	1876
Raleigh	388	9	29.69	30.12	+ .05	56.8	— 3.4	80	7	68	34	10	46	34	40	61	2.82	— 2.1	5	4,490	n.	22	nw.	12	16	5	10	3.7	88	1891	31	1893
Wilmington	78	25	30.01	30.10	— .00	62.0	— 2.7	84	7	72	39	10	52	29	49	70	1.67	— 2.3	3	6,360	ne.	25	ne.	1	21	5	5	2.7	92	1884	32	1876
Charleston	52	25	30.06	30.11	+ .01	66.0	— 1.7	88	7	74	49	10	58	23	53	71	0.77	— 3.6	3	6,622	n.	30	n.	30	16	13	2	3.4	93	1883	39	1873
Columbia	.....	9	.....	.....	.....	61.0	— 3.1	92	8	76	37	22	46	40	.....	.....	1.48	— 0.8	3	.....	ne.	.....	.....	.....	17	8	6	....	92	1895	32	1891
Augusta	180	24	29.90	30.10	+ .01	61.5	— 4.2	88	7	74	37	21	49	39	44	64	0.67	— 2.0	3	4,034	nw.	26	w.	8	22	4	5	2.8	94	1884	29	1873
Savannah	98	25	29.99	30.10	— .01	66.4	— 1.3	91	7	76	46	10	56	28	53	71	1.11	— 2.7	3	6,087	n.	26	ne.	18	19	7	5	3.1	92	*	37	1873
Jacksonville	43	25	30.00	30.06	— .01	69.7	— 1.8	89	7	79	52	14	60	28	60	78	0.58	— 5.1	4	5,596	ne.	26	n.	1	19	6	6	4.0	92	1884	40	1887
Florida Peninsula.						75.3	— 1.0										3.64	+ 3.8														
Jupiter	28	8	29.95	29.98	— .02	75.8	— 1.9	85	9	81	64	23	71	15	69	80	21.03	+15.9	16	10,631	ne.	55	n.	22	7	10	14	6.3	90	1893	48	1890
Key West	22	25	29.95	29.97	— .02	78.6	— 0.4	87	9	82	70	22	75	13	72	82	4.77	— 0.5	14	9,521	ne.	49	n.	22	12	8	11	5.3	92	1876	59	1892
Tampa	36	6	29.99	30.03	.....	73.6	— 0.2	88	12	82	59	*	65	25	63	75	3.04	+ 0.8	5	5,275	n.	25	ne.	1	11	18	2	4.7	90	1890	45	1892
Titusville	44	9	29.99	30.08	— .01	73.1	— 1.4	86	7	79	60	24	67	25	67	82	5.73	— 1.0	12	11,908	ne.	47	n.	22	14	10	7	4.5	91	1893	44	1892
East Gulf States.						65.1	— 2.5										2.08	— 0.8														
Atlanta	1,131	18	28.92	30.12	— .02	59.6	— 2.6	82	6	70	36	31	50	30	46	67	1.30	— 1.0	5	7,352	nw.	30	nw.	8	23	2	6	2.6	91	1884	30	1887
Pensacola	56	16	30.01	30.07	— .01	68.1	— 1.6	85	23	77	50	9	59	31	52	63	2.67	— 1.1	4	7,277	n.	28	ne.	31	21	5	5	2.8	95	1884	38	1887
Mobile	57	25	30.04	30.10	+ .02	65.5	— 3.2	86	5	76	46	22	55	31	53	72	3.50	+ 0.2	5	5,463	n.	24	n.	8	17	5	9	3.6	93	1884	34	*
Montgomery	221	24	29.86	30.10	.00	63.4	— 3.6	90	6	76	43	*	51	37	45	60	1.36	— 1.4	6	4,088	n.	23	ne.	1	21	8	7	2.9	96	1884	31	1873
Meridian	358	7	29.73	30.12	+ .02	60.0	— 3.2	90	6	74	33	21	46	44	45	71	3.02	+ 1.9	6	3,387	ne.	22	n.	8	20	6	5	2.8	90	1895	29	1891
Vicksburg	254	25	29.83	30.09	— .02	62.6	— 4.4	88	6	74	42	10	51	33	46	62	1.62	— 1.4	5	4,062	ne.	30	sw.	27	24	3	4	2.2	94	1884	34	1887
New Orleans	54	25	30.03	30.09	+ .03	68.6	— 2.1	87	6	77	52	9	60	23	54	66	1.21	— 2.2	5	5,997	ne.	30	nw.	30	25	2	4	2.0	90	*	40	1873
Port Eads	.....	8	.....	.....	.....	72.8	— 0.4	82	*	77	63	*	68	17	63	74	2.02	— 1.4	7	.....	ne.	.....	.....	.....	15	11	5	3.9	....	....	.....	.....
West Gulf States.						64.6	— 3.3										2.17	— 1.2														
Shreveport	249	25	29.85	30.12	+ .03	62.4	— 4.6	90	6	74	41	31	51	34	47	64	2.50	— 1.0	3	4,109	ne.	25	nw.	7	17	8	6	3.6	95	1883	31	1873
Fort Smith	481	14	29.62	30.14	+ .06	56.8	— 5.9	82	*	70	30	28	43	41	43	66	1.38	— 2.2	7	8,817	e.	26	n.	27	18	7	6	3.3	95	1884	28	1894
Little Rock	302	17	29.82	30.14	+ .04	58.6	— 5.1	84	22	70	38	28	48	37	43	65	2.22	— 0.4	6	4,123	n.	27	n.	11	18	9	4	3.5	90	1884	33	*
Corpus Christi	20	9	30.06	30.08	+ .01	70.8	— 2.2	90	17	78	53	31	64	32	62	78	1.08	— 2.3	6	7,744	n.	31	ne.	29	16	10	5	3.8	90	*	42	1894
Galveston	42	25	30.06	30.10	+ .03	69.7	— 2.8	83	6	75	50	31	65	17	60	77	2.93	— 2.0	5	7,558	ne.	31	ne.	8	23	4	4	2.6	89	1890	45	1873
Palestine	510	14	29.58	30.12	+ .03	64.8	— 1.9	87	5	76	43	31	53	38	49	67	3.73	— 0.1	5	3,994	ne.	29	nw.	7	11	12	8	5.1	97	1893	37	1888
San Antonio	704	17	29.36	30.10	+ .03	68.8	— 0.4	94	17	80	49	*	58	38	48	57	1.43	— 0.6	4	5,672	n.	27	n.	28	11	14	6	4.9	99	1877	39	1894
Ohio Val. & Tenn.						53.7	— 3.1										1.23	— 1.7														
Chattanooga	702	17	29.34	30.15	+ .02	57.2	— 4.5	83	5	70	34	21	44	43	41	64	2.00	— 1.3	6	4,213	w.	27	sw.	27	22	4	5	2.9	91	1884	27	1893
Knoxville	980	25	29.09	30.15	— .01	54.8	— 4.9	80	4	68	32	30	42	38	39	64	1.24	— 2.0	6	3,030	ne.	35	sw.	27	24	2	5	2.3	94	1884	25	1876
Memphis	399	25	29.72	30.15	— .04	58.4	— 4.6	81	22	69	37	31	46	30	43	64	2.17	— 1.0	7	5,959	n.	29	w.	26	20	5	6	3.4	92	1884	29	1878
Nashville	545	25	29.35	30.14	— .04	55.8	— 4.9	84	6	68	32	30	43	42	39	62	1.57	— 1.2	5	3,818	nw.	24	s.	11	22	5	4	2.5	92	1884	27	1887
Lexington	989	11	29.05	30.12	+ .04	52.3	— 4.9	78	6	63	23	30	42	31	31	49	1.28	— 1.4	7	8,012	w.	36	s.	11	16	8	7	3.6	88	1891	23	1895
Louisville	525	25	29.56	30.14	— .03	58.1	— 6.2	79	6	65	36	30	41	38	34	56	0.90	— 2.2	6	5,602	n.	36	w.	11	21	5	5	2.6	90	1884	26	*
Indianapolis	706	25	29.29	30.13	+ .03	49.4	— 4.6	78	3	60	22	30	38	39	33	60	0.83	— 2.3	6	4,353	nw.	24	w.	11	19	7	5	3.1	87	1884	22	*
Cincinnati	628	25	29.45	30.13	— .03	51.2	— 5.8	74	*	61	27	30	41	34	31	53	0.73	— 2.0	6	5,453	nw.	27	sw.	27	20	7	4	3.0	88	1884	26	1887
Columbus	824	18	29.22	30.11	+ .02	48.2	— 5.8	73	3	59	20	30	38	36	34	63	0.92	— 2.0	5	4,776	nw.	26	nw.	12	10	12	9	5.3	87	1884	20	*
Pittsburg	842	25	29.18	30.10	— .01	49.8	— 5.5	73	27	59	27	30	40	31	36	64	1.11	— 1.5	8	4,992	nw.	28	w.	28	16	9	6	4.1	91	*	20	1887
Parkersburg	638	8	29.43	30.13	+ .05	49.6	— 4.7	75	22	61	30	30	38	43	33	60	1.36	— 1.7	5	4,010	w.	30	w.	19	16	9	6	3.7	86	*	20	1895
Lower Lake Region.						45.8	— 5.7										1.75	— 1.5														
Buffalo	600	25	29.27	30.02	— .03	45.6	— 4.7	67	27	52	28	30	39	29	34	63	1.92	— 2.0	8	11,402	w.	59	w.	28	7	10	14	6.5	83	1879	24	1887
Oswego	335	25	29.03	30.01	— .05	44.8	— 4.5	71	27	52	27	26	38	30	34	66	2.39	— 1.0	12	9,314	s.	34	sw.	28	9	5	17	6.3	84	1877	24	1889
Rochester	523	25	29.46	30.03	— .03	44.9	— 4.6	71	27	53	27	30	37	32	34	72	1.38	— 1.8	13	6,383	sw.	38	sw.	19	13	9	9	4.8	87	1879	19	1879
Erie	714	23	29.27	30.05	— .01	45.8	— 6.5	69	27	52	23	28	39	30	36	71	3.40	— 0.9	11	9,353	s.	33	w.	19	9	10	12	5.6	85	1879	23	1895
Cleveland	740	25	29.26	30.07	— .01	46.7	— 6.0	68	26	54	27	30	40	34	35	66	1.71	— 1.2	8	11,588	se.	50	sw.	19	14	6	11	4.6	87	1879	24	1887
Sandusky	629	19	29.38	30.07	— .01	47.2	— 6.1	70	2	55	25	30	40	33	32	61	1.67	— 1.2	6	7,421	sw.	40	nw.	12	15	11	5	4.3	90	1891	24	1887
Toledo	674	25	29.34	30.08	+ .02	46.2	— 6.1	69	26	55	24	30	38	33	32	64	0.97	— 1.6	4	8,048	w.	36	w.	28	15	8	8	3.9	86	1891	21	1887
Detroit	724	25	29.36	30.05	— .01	45.4	— 6.9	70	2	54	23	21	37	33	32	65	0.56	— 2.0	5	9,557	sw.	38	nw.	19	13	10	8	4.3	85	1884	22	*
Upper Lake Region.						45.0	— 4.4										1.08	— 2.2														
Alpena	609	24	29.29	29.96	— .07	41.6	— 3.7	66	2	49	20	21	34	33	33	74	0.77	— 3.4	12	7,734	sw.	36	w.	7	6	16	9	6.1	87	1891	15	1887
Grand Haven	628	25	29.34	30.08	.00	45.2	— 4.1	67	4	52	22	21	38	35	34	67	0.43	— 3.2	8	9,322	nw.	38	nw.	19	11	9	11	5.4	81	1891	20	1887
Marquette	734	25	29.14	29.94	— .06	40.7	— 4.3	73	5	47	20	30	34	31	32	74	2.54	— 0.8	15	9,040	nw.	42	sw.	15	1	11	19	7.9	87	1879	12	1887
Port Huron	639	22	29.34	30.04	— .01	44.0	— 5.3	69	2	52	19	21	36	34	33	70	0.85	— 2.1	6	9,527	s.	40	sw.	27	15	13	3	3.7	86	1879	19	1895
Sault Ste. Marie	642	8	29.22	29.94	— .05	39.6	— 4.1	67	6	46	18	21	33	28	32	78	3.58	+ 0.1	17	7,138	nw.	37	nw.	7	4	9	18	7.2	77	1891	18	1895
Chicago	824	25	29.18	30.08	+ .03	46.2	— 6.0	71	26	54	24	28	38	29	31	57	0.51	— 2.9	4	12,834	sw.	56	sw.	18	19	5	7	3.5	86	1891	14	1887
Milwaukee	673	25	29.32	30.06	+ .02	44.9	— 4.9	74	2	53	20	30	36	33	33	67	0.52	— 2.0	5	8,372	sw.	35	w.	19	15	5	11	4.5	87	1891	15	1887
Green Bay	617	10	29.35	30.09	— .03	42.4	— 4.6	71	5	52	14	30	33	38	29	64	0.40	— 2.4	7	7,394	s.	36	w.	7	4	15	12	6.3	84	1891	8	1887
Duluth	709	25	29.20	29.98	— .02	42.0	— 2.5	70	5	49	16	30	35	27	30	68	0.09	— 2.7	4	7,617	nw.	34	nw.	18	9	14	8	5.3	80	1886	8	1887
North Dakota.						41.3	— 1.2										0.34	— 1.2														
Moorhead	905	15	29.00	30.04	+ .04	41.1	— 1.4	81	17	54	3	29	28	48	25	62	0.21	— 2.0	5	8,942	nw.	40	nw.	18	13	8	10	5.0	84	1885	3	1895
St. Vincent	794	16	29.11	29.99	.00	39.0	— 1.3	79	12	51	9	29	26	45	29	81	0.74	— 1.1	6	7,524	nw.	40	n.	18	7	14	10	5.6	82	1886	—10	1887
Bismarck	1,681	22	28.27	30.10	+ .10	43.0	— 1.0	84	17	58	— 2	29	28	54	22	53	0.08	— 1.0	2	7,677	nw.	47	nw.	26	14	11	6	4.2	88	1879	— 2	1895
Williston	1,875	17	28.04	30.07	+ .06	42.2	— 1.3	80	12	56	— 3	29	28	44	23	55	0.35	— 0.6	5	7,086	nw.	50	nw.	18	16	11	4	4.3	95	1879	— 3	1895
Upper Miss. Valley.						43.5	— 4.3										0.40	— 2.5														
Minneapolis	.....	6	.....	.....	.....	44.9	— 3.9	73	1	56	16	29	34	41	.....	.....	0.05	— 2.1	3	.....	s.	.....	.....	.....	14	9	8	....	84	1892	16	1895
St. Paul	850	25	29.12	30.06	+ .05	43.8	— 3.7	73	1	54	15	30	34	39	28	60	0.09	— 1.8	4	6,506	w.	36	nw.	18	16	5	10	4.5	87	1879	12	1887
La Crosse	790	25	29.28	30.07	— .05	44.9	— 4.6	72	2	55	13	30	35	41	32	68	0.54	— 1.9	5	6,026	s.	26	w.	27	13	9	9	4.6	84	*	6	1887
Davenport	613	24	29.42	30.09	+ .02	47.4	— 4.8	74	*	57	20	29	36	37	32	62	0.81	— 2.2	5	6,740	sw.	38	w.	27	18	9	4	3.2	87	1891	17	1887
Des Moines	869	19	29.18	30.13	+ .07	48.2	— 3.6	75	21	60	15	29	36	42	29	56	0.29	— 3.3	3	5,806	nw.	28	nw.	27	21	3	5	2.9	87	1892	14	1887

TABLE I.—*Climatological data for Weather Bureau Stations, October*, 1895—Continued.

Stations.	Elevation above sea-level, feet.	Length of record, years.	Pressure, in inches.			Temperature of the air, in degrees Fahrenheit.								Humidity and precipitation.				Wind.							Monthly temperature data since opening station.			
			Mean pressure, 8 a. m. and 8 p. m. +2.	Mean reduced.	Departure from normal.	Mean max. and min. +2.	Departure from normal.	Maximum.	Date.	Mean maximum.	Minimum.	Date.	Mean minimum.	Greatest daily range.	Mean temperature of the dew-point.	Mean relative humidity, per cent.	Precipitation, in inches.	Departure from normal.	Days with .01, or more.	Total movement, miles.	Prevailing direction.	Maximum velocity. Miles per hour.	Maximum velocity. Direction.	Maximum velocity. Date.	Clear days.	Partly cloudy days.	Cloudy days.	Average cloudiness, tenths.	Absolute maximum.	Year.	Absolute minimum	Year.
Up. Miss. Val.—Con																															
Dubuque	.....	23	.....	.....	.....	47.8	— 3.0	75	2	58	16	30	37	38	.....	.....	0.80	— 2.3	4	.....	s.	.....	.....	.....	22	7	2	....	87	1891	15	1887
Keokuk	613	25	29.45	30.12	+ .05	50.0	— 4.0	77	*	61	20	29	39	42	31	* 57	0.37	— 2.9	3	5,685	sw.	36	w.	28	23	5	3	2.2	90	1893	20	*
Cairo	359	25	29.74	30.13	+ .04	54.6	— 5.1	79	4	66	30	30	44	34	39	64	0.50	— 2.5	2	5,038	n.	29	w.	26	19	6	6	3.5	88	*	24	1873
Springfield, Ill.	644	17	29.42	30.12	+ .03	49.5	— 5.5	75	26	60	21	30	38	39	31	56	0.27	— 3.2	4	6,926	nw.	34	w.	27	20	7	4	2.7	88	*	20	1887
Hannibal	534	....	29.54	30.12	.....	50.2	.....	78	18	62	22	30	38	39	33	60	0.36	.....	3	6,364	sw.	35	nw.	27	20	9	2	2.5	....	.....	.....	....
St. Louis	571	25	29.54	30.16	+ .08	53.6	— 4.4	77	26	63	30	30	44	33	35	56	0.23	— 2.5	3	6,970	nw.	36	sw.	27	20	6	5	3.0	90	1879	34	1887
Missouri Valley.						50.5	— 2.8										0.32	— 1.8													
Columbia	.....	7	.....	.....	.....	52.4	— 4.5	83	14	68	19	29	36	50	.....	.....	0.25	— 1.3	3	5,940	nw.	36	nw.	11	20	4	7	3.2	93	1893	19	1895
Kansas City	963	8	29.13	30.17	+ .10	53.2	— 3.3	80	18	64	26	28	43	34	34	55	0.12	— 3.5	2	5,730	sw.	33	nw.	11	21	5	5	2.8	90	1893	26	1896
Springfield, Mo	1,324	10	28.73	30.15	+ .07	53.0	— 5.2	76	16	63	28	29	43	36	35	58	0.78	— 2.6	6	6,062	nw.	30	n.	11	20	6	5	2.7	88	1893	21	1887
Topeka	.....	9	.....	.....	.....	53.8	— 0.3	83	21	66	25	28	41	41	.....	.....	0.44	— 1.7	4	.....	s.	.....	.....	.....	21	4	6	....	90	*	22	1887
Omaha	1,123	25	28.94	30.15	+ .07	50.4	— 2.4	77	2	62	17	29	39	39	28	50	0.07	— 2.5	2	5,382	nw.	26	nw.	6	18	7	6	3.4	89	1893	15	1878
Sioux City	1,165	7	28.85	30.11	+ .09	47.4	— 4.3	76	2	60	12	29	35	47	37	58	0.10	— 1.6	2	7,914	nw.	41	nw.	18	16	10	5	3.8	90	1892	12	1895
Pierre	1,470	21	28.50	30.08	+ .05	48.4	— 1.1	87	*	63	4	29	34	49	31	59	T.	— 0.6	0	6,027	se.	42	nw.	18	16	11	4	4.0	98	1892	4	1895
Huron	1,310	15	28.67	30.10	+ .07	45.1	— 1.4	81	12	61	3	29	29	55	26	59	0.22	— 1.1	2	10,091	nw.	48	nw.	18	16	12	3	3.6	94	1892	3	1895
Northern Slope.						46.3	+ 0.2										0.45	— 0.3													
Havre	2,477	16	27.44	30.08	+ .06	45.0	+ 1.5	78	11	61	12	*	29	52	25	53	0.12	— 0.4	3	6,182	nw.	39	w.	25	21	5	5	3.5	89	1889	—16	1881
Miles City	2,374	18	27.57	30.09	.....	47.5	+ 1.4	83	12	62	14	29	33	47	30	59	0.89	0.0	1	4,870	s.	32	w.	26	19	8	4	3.7	85	1892	— 5	1887
Helena	4,108	16	25.97	30.19	+ .13	47.3	+ 2.3	75	12	59	25	22	36	36	29	56	0.28	— 0.6	3	4,507	sw.	35	n.	29	16	11	4	3.8	80	1889	3	1887
Rapid City	3,260	10	26.69	30.09	+ .05	48.2	— 0.6	85	17	61	10	29	35	50	28	53	0.02	— 0.5	1	7,241	w.	42	n.	18	14	14	3	4.3	96	1892	10	1895
Cheyenne	6,105	25	24.12	30.18	+ .11	44.6	— 1.4	73	12	58	12	27	31	41	23	51	0.95	+ 0.2	4	6,955	nw.	42	nw.	26	18	9	4	3.0	83	1892	— 5	1878
Lander	5,377	13	24.76	30.22	+ .14	43.2	+ 0.2	72	*	59	10	27	28	45	26	66	1.00	— 0.1	5	1,606	sw.	24	nw.	9	19	9	3	2.9	81	1889	10	*
North Platte	2,826	22	27.18	30.17	+ .11	48.2	— 2.0	81	12	64	14	29	32	50	31	62	0.09	— 1.0	2	6,340	w.	36	nw.	18	18	8	5	3.4	89	1879	9	1887
Middle Slope.						52.3	— 1.9										1.04	— 0.3													
Denver	5,309	24	24.85	30.18	+ .12	50.7	0.0	80	12	65	21	27	36	42	27	53	1.13	+ 0.3	4	5,020	s.	36	ne.	26	17	11	3	3.6	90	1892	1	1873
Pueblo	4,734	8	25.37	30.16	+ .11	50.8	— 1.2	81	9	66	19	31	35	46	26	50	1.46	+ 1.1	3	4,758	nw.	38	ne.	30	18	9	4	3.2	87	1889	19	1895
Concordia	1,410	11	28.65	30.16	+ .10	52.4	— 2.4	83	14	65	20	28	39	41	34	60	0.70	— 1.0	4	4,540	n.	24	s.	9	26	1	4	2.7	92	1887	20	1895
Dodge City	2,504	22	27.51	30.14	+ .11	52.8	— 3.0	82	21	66	26	28	40	45	32	57	1.09	— 0.2	5	6,822	se.	33	s.	9	22	4	5	3.0	94	1889	10	1878
Wichita	1,351	8	28.70	30.14	+ .12	54.8	— 2.9	83	21	67	29	29	43	41	34	54	0.81	— 1.5	7	5,210	s.	32	n.	27	21	4	6	3.1	91	1889	29	1895
Oklahoma	1,239	....	28.85	30.18	.....	55.7	.....	83	16	67	34	20	44	37	41	67	2.98	.....	9	5,065	s.	32	n.	27	20	5	6	3.2	92	*	32	1896
Southern Slope.						.....	.....										.....	.....													
Abilene	1,749	11	28.33	30.17	+ .09	60.6	— 4.6	88	16	71	40	20	50	40	43	65	4.13	+ 1.1	7	5,127	n.	35	n.	27	13	7	11	4.9	94	1893	34	1887
Amarillo	3,691	....	26.37	30.16	.....	53.1	.....	80	21	64	31	31	42	38	36	64	2.26	.....	10	10,822	s.	48	n.	27	17	5	9	4.1	84	1893	31	1895
Southern Plateau.						64.6	+ 0.8										0.90	+ 0.1													
El Paso	3,767	18	26.25	30.06	+ .05	61.2	— 2.5	83	5	74	41	24	49	38	39	55	0.88	— 0.3	3	6,880	e.	43	ne.	31	16	12	3	3.3	94	1879	28	1892
Santa Fe	6,998	22	23.36	30.10	+ .06	49.6	— 0.1	70	13	60	27	31	39	31	28	52	1.75	+ 0.7	6	4,081	se.	31	se.	18	22	6	3	3.2	85	1878	16	1880
Phœnix	1,106	....	28.76	29.91	.....	71.9	+ 2.6	93	15	86	48	31	58	35	51	53	0.80	+ 0.2	4	3,198	s.	26	se.	3	22	6	3	2.9	....	.....	.....	....
Yuma	141	21	29.72	29.86	— .05	75.5	+ 3.0	99	2	90	54	26	61	40	50	50	0.15	— 0.2	3	3,808	ne.	21	w.	21	28	2	1	1.2	108	1887	41	1888
Independence	3,884	....	26.06	29.98	.....	60.0	.....	88	*	75	37	29	46	39	30	40	0.83	.....	4	4,721	nw.	30	nw.	3	20	7	4	2.5	....	.....	.....	....
Middle Plateau.						51.8	+ 2.0										0.33	— 0.5													
Carson City	4,730	8	25.36	30.11	.....	50.2	+ 0.1	79	1	68	30	28	32	48	24	40	0.76	+ 0.5	4	.....	nw.	.....	.....	.....	24	3	4	2.2	85	1889	20	1895
Winnemucca	4,340	17	25.74	30.10	+ .03	50.8	+ 2.8	80	1	70	18	25	32	49	16	29	T.	— 0.5	0	5,844	ne.	38	s.	16	24	7	0	1.5	87	1889	10	1878
Salt Lake City	4,345	22	25.72	30.11	+ .02	54.3	+ 3.1	81	16	66	32	31	42	32	36	54	0.24	— 1.5	3	3,966	nw.	28	e.	22	18	8	5	3.9	86	1889	22	1878
Northern Plateau.						50.3	+ 2.5										0.02	— 1.5													
Baker City	3,430	7	26.55	30.08	+ .04	50.6	+ 3.0	78	16	67	22	27	35	42	30	53	T.	— 1.1	0	4,282	s.	19	n.	2	25	6	0	1.5	85	1889	21	1890
Idaho Falls	4,742	6	25.34	30.17	.....	46.2	+ 2.6	77	16	65	13	27	28	49	22	47	0.06	— 1.2	1	4,441	nw.	36	nw.	3	24	5	2	2.5	80	1892	13	1895
Spokane	1,930	15	28.08	30.15	+ .09	50.5	+ 3.2	76	12	66	22	27	36	36	32	57	T.	— 1.9	0	2,176	ne.	24	sw.	9	14	14	3	4.0	86	*	12	1887
Walla Walla	1,018	10	29.04	30.13	+ .05	55.7	+ 1.1	84	12	68	30	28	44	32	41	59	0.00	— 1.8	0	2,649	s.	19	sw.	9	23	8	0	3.0	86	1892	24	1887
N. Pac. Coast Reg.						52.9	+ 0.8										0.47	— 0.8													
East Clallam	.....	.....	.....	.....	.....	49.2	.....	69	18	56	31	30	42	30	.....	.....	0.81	.....	5	.....	e.	.....	.....	.....	12	2	17	.....	.....	.....	.....	.....
Fort Canby	179	13	29.92	30.12	+ .09	54.4	+ 1.2	83	15	60	43	29	49	24	50	88	0.31	— 5.1	4	5,376	n.	47	s.	31	9	8	14	5.7	83	1895	38	1893
Neah Bay	.....	12	.....	.....	.....	51.0	+ 0.3	72	18	58	34	30	44	28	.....	.....	1.27	—11.0	6	.....	e.	.....	.....	.....	10	4	17	.....	68	1888	27	1895
Port Angeles	29	11	30.09	30.12	+ .10	48.4	+ 0.7	65	30	55	32	30	42	22	44	86	0.15	— 2.8	3	2,945	s.	24	w.	9	14	8	9	4.7	65	1895	28	1893
Port Crescent	.....	.....	.....	.....	.....	48.6	.....	69	*	60	28	29	37	35	.....	.....	0.09	.....	1	.....	e.	.....	.....	.....	16	11	4	.....	.....	.....	.....	.....
Pysht	.....	.....	.....	.....	.....	48.2	.....	65	18	54	31	30	42	25	.....	.....	0.75	.....	2	.....	e.	.....	.....	.....	17	3	11	.....	.....	.....	.....	.....
Seattle	119	....	29.98	30.11	.....	51.6	.....	73	18	58	38	28	45	28	46	83	0.02	.....	1	2,254	n.	20	s.	31	13	2	16	6.0	.....	.....	.....	.....
Tatoosh Island	86	13	30.02	30.12	+ .09	50.6	+ 0.2	72	18	54	41	30	47	25	47	88	1.32	— 7.9	8	8,790	e.	46	e.	15	9	3	19	6.9	72	1895	38	*
Astoria	.....	11	.....	.....	.....	53.4	+ 0.6	76	15	61	42	30	50	25	.....	.....	0.23	— 6.4	5	.....	w.	.....	.....	.....	17	4	10	....	76	1895	34	1893
Portland, Oreg.	157	24	29.92	30.10	+ .02	56.0	+ 2.0	79	11	66	31	30	46	32	44	71	T.	— 4.3	0	5,048	nw.	33	ne.	18	12	16	3	4.4	85	1891	31	*
Roseburg	523	19	29.48	30.05	— .06	54.4	+ 0.6	83	12	67	33	30	42	41	45	76	0.00	— 2.8	0	1,708	w.	16	n.	2	24	4	3	2.3	91	1885	22	1881
Mid. Pac. C'st Reg.						59.4	— 1.1										0.15	— 1.7													
Eureka	64	9	29.98	30.04	— .02	52.0	— 0.1	76	4	57	41	*	47	31	49	92	0.05	— 2.4	2	3,091	nw.	38	nw.	3	5	8	18	7.3	82	1887	38	1893
Red Bluff	334	19	29.63	29.98	— .03	67.0	+ 4.0	94	14	81	43	31	53	40	42	49	T.	— 1.6	0	3,516	nw.	34	n.	3	23	7	1	1.8	97	1892	32	1881
Sacramento	71	19	29.89	29.96	— .05	64.7	+ 3.0	88	1	77	44	31	52	35	49	65	0.17	— 0.9	3	4,961	s.	36	w.	15	20	9	2	2.8	98	1885	36	1881
San Francisco	158	25	29.84	30.00	— .02	58.8	— 1.0	83	3	66	48	8	52	25	51	85	0.11	— 1.2	4	6,478	w.	36	w.	11	17	12	2	3.8	89	1894	45	1881
Point Reyes Light	.....	6	.....	.....	.....	54.4	— 0.6	79	10	61	43	31	47	29	.....	.....	0.42	— 2.3	2	.....	nw.	.....	.....	.....	5	6	20	.....	.....	.....	.....	.....
S. Pac. Coast Reg.						65.5	+ 1.0										0.22	— 0.4													
Fresno	332	9	29.59	29.94	— .04	66.6	+ 0.6	95	1	81	40	30	52	39	44	54	0.16	— 0.4	5	3,040	nw.	16	w.	20	20	8	3	2.4	100	1887	36	1892
Los Angeles	330	19	29.61	29.96	— .02	65.6	— 1.3	91	2	76	45	31	55	41	55	82	0.24	— 0.7	2	2,305	w.	14	w.	24	12	18	1	3.9	102	1885	40	1892
San Diego	69	24	29.88	29.96	— .03	64.4	+ 1.1	84	25	71	54	18	58	28	56	78	0.27	— 0.2	2	3,842	nw.	16	nw.	1	16	12	3	4.4	92	1879	44	1878
San Luis Obispo	201	....	29.77	29.99	.....	62.7	.....	92	2	75	39	31	50	45	51	78	1.80	.....	5	2,716	nw.	16	nw.	22	16	8	7	4.2	....	.....	.....	....

NOTE.—The data at stations having no departures are not used in computing the district averages. Letters of the alphabet denote number of days missing from the record.

* Two or more directions, dates, or years. † Received too late to be considered in departures, etc.

TABLE II.—*Meteorological record of voluntary and other cooperating observers, October, 1895.*

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Alabama.	°	°	°	*Ins.*	*Ins.*
Aloo	93	38	63.4	.....	
Ashville*†[1]	89	30	57.4	2.38	
Bermuda†	91	38	63.0	2.26	
Birmingham†	90	37	61.2	2.75	
Brewton†	93	26	61.3	2.00	
Carrollton*†[1]	84	36	60.0	3.27	
Citronelle†	86	50	66.0	2.89	
Claiborne Landing	.....	.....	.....	2.00	
Clanton†	87	35	59.8	2.09	
Collirene*[1]	88	44	66.2	0.90	
Cordova†	.....	.....	.....	3.19	
Daphne†	87	44	66.9	4.44	
Decatur†	84	29	53.8	1.61	
Demopolis†	.....	.....	.....	1.78	
Elba†	92	38	65.8	1.43	
Eufaula *a*†	89	41	64.6	1.33	
Eufaula *c*†	.....	.....	.....	0.99	
Evergreen†	89	38	62.8	1.68	
Florence *a*†	.....	.....	.....	1.86	
Florence *b*†	83	32	55.6	1.92	
Fort Deposit†	89	39	62.6	2.14	
Gadsden†	87	31	59.0	0.50	
Goodwater†	93	34	62.7	2.00	
Greensboro†	89	38	60.8	1.25	
Healing Springs†	93	30	60.8	2.36	
Highland Home†	90	44	65.0	2.17	
Jasper†	86	27	55.4	4.55	
Livingston†	89	32	60.7	1.42	
Look No. 4	.....	.....	.....	2.26	
Madison Station†	84	30	55.1	1.80	
Maple Grove†	82	30	54.4	2.54	
Marion†	88	42	62.2	3.26	
Mount Willing†	90	36	63.0	1.02	
Newbern†	89	37	61.3	1.70	
Newburg†	91	29	56.5	2.75	
Newton†	88	43	64.2	2.68	
Oneonto	85	.....	.....	2.52	
Opelika†	89	42	65.2	0.90	
Oxanna*†[1]	84	33	60.3	2.70	
Pine Apple†	89	32	58.6	1.82	
Pushmataha†	91	36	61.1	2.11	
Scottsboro†	87	28	55.4	1.84	
Selma†	.....	.....	.....	1.84	
Sturdevant†	.....	.....	.....	0.40	
Thomasville†	88	42	63.2	0.06	
Tuscaloosa†	88	33	59.1	2.30	
Tuscumbia†	84	32	54.1	2.50	
Union†	88	35	61.4	1.90	
Union Springs†	88	40	62.2	1.00	
Uniontown†	91	43	64.2	2.94	
Valley Head†	84	29	55.8	2.02	
Wetumpka	.....	.....	.....	1.71	
Wilsonville†	.....	.....	.....	2.72	
Alaska.					
Killisnoo†	55	31	74.8	8.45	
Arizona.					
Arizona Canal Co. Dam.	101	55	76.7	1.14	
Benson*§	89	56	70.6	0.00	
Bisbee†	78[e]	44[e]	62.8[e]	1.12	
Buckeye†	98	43	70.8	0.40	
Calabasas†	84	32	61.3	0.12	
Casa Grande*§	98	54	72.1	1.60	
Dragoon	.....	.....	.....	0.55	
Dragoon Summit*§	90	53	73.1	0.09	
Dudleyville	87	39	65.7	1.56	
Eagle Pass*§	.....	34	55.6	3.76	
Flagstaff	73	21	48.9	.....	
Fort Apache	76	35	54.2	3.02	
Fort Grant†	82	41	62.2	1.21	
Fort Huachuca	81	38	60.9	0.35	
Fort Mohave	108	44	75.9	0.32	
Gila Bend *a**§	96	58	76.1	0.50	
Gila Bend *b*	104	52	78.5	1.13	
Gisela†	85	34	62.6	1.13	
Holbrook†	79	30	55.6	1.24	
Maricopa*§	101	50	75.7	1.10	
Mount Huachuca†	79	41	60.5	0.57	
Natural Bridge†	.....	.....	.....	0.60	
Navajo*†[5]	72	43	57.4	1.20	
Oracle†	80	45	63.2	2.18	
Oro	.....	.....	.....	0.70	
Oro Blanco	94	48	68.4	0.50	
Pantano*§	98	55	67.8	0.55	
Parker	106	45	74.6	T.	
Peoria†	92	53	72.1	1.39	
Pinal Ranch	.....	.....	.....	4.78	
Reymert	90	.....	.....	2.25	
San Carlos†	90	42	65.7	3.01	
San Simon*§	89	54	70.8	0.08	
Show Low	.....	.....	.....	2.64	
Signal†	98	47	71.2	T.	
Sulphur Spring Valley†	.....	.....	.....	0.51	
Texas Hill*§	100	58	77.3	0.00	
Tucson *c*†	93	38	66.8	0.08	
Walnut Ranch*†[1]	89	39	60.4	0.47	
Wells	94	46	71.0	0.98	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Arizona—Cont'd.	°	°	°	*Ins.*	*Ins.*
Whipple Barracks†[a]	85	25	55.1	0.24	
Wilgus†	.....	.....	.....	0.58	
Willcox*§	85	40	60.0	0.08	
Arkansas.					
Arkadelphia†	.....	.....	.....	1.10	
Arkansas City†	.....	.....	.....	0.90	
Bee Branch†	88	30	58.3	1.25	
Blanchard Springs†	90	32	59.4	1.37	
Brinkley†	84	30	55.6	2.46	
Camden *a*†	.....	.....	.....	1.49	
Camden *b*†	83	31	57.2	1.42	
Conway*[1]	86	36	55.5	1.38	
Corning†	80	23	51.8	0.81	
Dallas†	89	31	57.6	2.20	
Dardanelle†	.....	.....	.....	1.00	
Elon†	95	31	62.4	1.14	
Fayetteville†	84	28	55.6	1.47	
Forrest†	84	32	57.2	2.23	
Fulton†	.....	.....	.....	1.94	
Gaines Landing	.....	.....	.....	0.37	
Helena *a*†	.....	.....	.....	1.49	
Helena *b*†	92	31	61.2	1.34	
Hot Springs *a*	90	32	61.0	1.02	
Hot Springs *b*	.....	.....	.....	0.81	
Hot Springs (near)	.....	.....	.....	2.16	
Keesees Ferry†	87	21	54.2	0.80	
Kirby†	84[e]	34[e]	59.8[e]	1.25	
La Crosse†	81	28	55.2	1.72	
Lonoke*§	86	36	55.0	1.62	
Luna Landing*§	86	36	58.3	1.17	
Malvern†	86	29	55.6	2.72	
Mossville	78[k]	41[k]	58.8[k]	1.43	
Mount Nebo†	76	34	59.2	1.68	
New Gascony*[1]	81[b]	37[e]	58.0[f]	1.93	
Newport *a*†	.....	.....	.....	1.02	
Newport *b*†	84	28	55.0	0.65	
Newport *c*†	84	25	54.8	1.01	
Osceola†	92	31	56.0	1.10	
Ozark†	88	35	59.5	1.63	
Pine Bluff†	88	34	58.6	1.18	
Pocahontas†	79	26	52.3	0.82	
Prescott†	90	34	59.0	1.34	
Rison†	85	29	55.9	1.09	
Russellville†	83	34	56.4	2.17	
Silver Springs†	78	25	51.2	0.59	
Stuttgart†	84	32	56.1	1.37	
Texarkana†	85	35	59.6	2.91	
Warren†	88	31	59.1	1.12	
Washington†	92	33	59.5	1.26	
Wiggs	.....	.....	.....	0.90	
Winslow†	78	32	54.6	2.70	
Witts Springs	79[e]	29[e]	52.4[e]	1.10	
California.					
Adin	82	29	54.6	0.00	
Ager	86	30	59.5	0.00	
Agnew	87	40	58.8	0.33	
Arlington Heights	100	44	64.9	0.00	
Athlone*§	95	50	66.4	0.25	
Ballast Point L. H.	.....	.....	.....	0.12	
Barstow	94	37	64.2	0.00	
Bear Valley†	.....	.....	.....	1.25	
Berkeley	83	47	59.2	0.07	
Bishop†	89	27	53.7	0.19	
Bishop Creek*§	90	45	56.6	0.16	
Boca*§	.....	23	48.2	0.11	
Bodie†	69	6	38.4	0.37	T.
Bowmans Dam†	.....	.....	.....	0.45	
Borden*[c]	99	40	67.1	0.00	
Caliente*§	90	51	67.6	2.31	
Calloway Canal†	.....	.....	.....	0.55	
Cape Mendocino L. H.	.....	.....	.....	0.04	
Cedarville†	80	24	53.9	0.09	
Centerville*[1]	93	50	62.6	0.72	
Chino*[1]	95	41	64.8	0.08	
Chico*§	94	42	65.6	0.00	
Cisco*§	67	33	47.6	.....	
Claremont	92	44[f]	63.3[e]	0.05	
Cloverdale*[1]	90	42	66.6	0.12	
Colegrove	.....	.....	.....	0.22	
Corning*§	93	45	68.0	0.00	
Coronado	82	56	66.0	0.27	
Crafton	96	40	66.0	.....	
Crescent City†	82	43	54.3	0.00	
Crescent City L. H.	.....	.....	.....	0.00	
Davisville *b*	93	40	67.6	0.03	
Delano*§	97	49	69.5	0.65	
Delta*§	90	42	62.5	0.00	
Dry Creek*§	.....	43	60.8	.....	
Drytown	92	37	63.0	0.13	
Dunnigan*§	92	40	67.3	0.38	
Durham*[1]	95	40	61.6	0.00	
East Brother L. H.	.....	.....	.....	0.05	
Edgwood*§	77	34	56.1	0.05	
Edmanton*[1]	77	35	52.1	1.13	
Escondido	92	44	64.2	.....	
Evergreen	.....	.....	.....	0.90	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
California—Cont'd.	°	°	°	*Ins.*	*Ins.*
Fall Brook*[1]	90	44	62.5	0.06	
Folsom City *b*[1]	98	44	64.0	0.09	
Fordyce Dam	.....	.....	.....	0.44	
Fort Bragg†[k]	79	37	55.1	0.09	
Fort Ross	.....	.....	.....	0.00	
Fort Tejon	.....	.....	.....	1.42	
Georgetown†	84	44	63.0	0.30	
Goshen*§	92	39	63.4	0.31	
Grass Valley	.....	.....	.....	0.02	
Greenville†	84	22	52.6	0.75	
Guinda	.....	.....	.....	0.15	
Hollister	88	40	61.8	0.82	
Hueneme	.....	.....	.....	0.23	
Humboldt L. H.	.....	.....	.....	0.04	
Hydesville†	84	40	56.6	T.	
Indio*§	108	63	81.7	0.00	
Iowa Hill*[1]	88	49	63.4	0.17	
Jackson	81	44	60.1	0.28	
Jolon	.....	.....	.....	1.80	
Julian†	92	35	59.4	0.70	
Keeler*§	89	44	65.1	0.00	
Keene*§	87	42	60.6	1.37	
Kennedy Gold Mine	89	44	64.1	0.19	
Kernville	.....	.....	.....	0.50	
King City*§	90	40	58.1	1.46	
Kingsburg*§	90	40	66.6	0.13	
Kono Tayee	80	48	63.5	0.00	
Lagrange*§	96	42	67.6	0.54	
La Porte*†[1]	72	34	49.8	0.69	
Lemoore a*§	92	43	65.4	0.83	
Lick Observatory†	81	41	59.9	0.78	
Lime Kiln	98	45	70.0	.....	
Lime Point L. H.	.....	.....	.....	0.04	
Lodi	89	40	63.7	0.13	
Los Alamos†	.....	.....	.....	0.33	
Los Gatos *b*	86	38	59.6	1.59	
McMullin*[1]	96	42	68.2	.....	
Malakoff Mine*[1]	81	40	58.7	0.56	
Mammoth Tank*§	98	60	77.6	0.00	
Manzana	91	36	59.4	0.40	
Mare Island L. H.	.....	.....	.....	0.06	
Merced*§	89	41	66.5	0.50	
Middletown*†[1]	96	36	62.7	0.00	
Mills College	.....	.....	.....	0.28	
Milton (near)*[1]	95	50	69.7	0.08	
Modesto*§	94	40	62.8	T.	
Mohave*§	93	48	66.1	0.80	
Mokelumne Hill*§	.....	48	62.8	0.12	
Monterey*§	76	46	58.3	0.78	
Mount Frazier	.....	.....	.....	0.30	
Mount Glenwood*[1]	89	48	69.4	0.07	
Mutah Flat	.....	.....	.....	0.65	
Napa *b*	87	44	65.1	0.03	
Needles†	108	53	73.4	T.	
Nevada City†	81	34	56.8	0.00	
Newcastle *a*†	87	44	64.9	T.	
Newhall*§	102	38	63.5	0.10	
Nordhoff	97	37	62.6	0.07	
North Berkeley*[1]	76	50	60.0	0.05	
Oakland *a*	84	47	56.0	0.13	
Ogilby*§	104	61	76.5	0.00	
Oleta*[1]	84	41	58.2	0.12	
Orange	89	45	64.3	.....	
Orangevale†	88	41	64.0	0.14	
Orland*§	97	42	68.2	0.00	
Ormonde†	.....	.....	.....	1.30	
Oroville *b*	92	53	70.3	0.11	
Palermo†	90	38	63.8	0.06	
Paso Robles *b*	91	35	62.8	0.61	
Petaluma*[1]	90	46	61.1	0.15	
Picacho	100	61	79.3	T.	
Piedras Blancas L. H.	.....	.....	.....	3.15	
Pigeon Point L. H.	.....	.....	.....	0.12	
Pilot Creek	.....	.....	.....	0.61	
Placerville *b*	88	33	58.6	0.16	
Point Ano Nuevo L. H.	.....	.....	.....	0.08	
Point Arena L. H.	.....	.....	.....	0.05	
Point Bonita L. H.	.....	.....	.....	0.28	
Point Conception L. H.	.....	.....	.....	1.11	
Point Fermin L. H.	.....	.....	.....	0.05	
Point George L. H.	.....	.....	.....	0.00	
Point Hueneme L. H.	.....	.....	.....	0.22	
Point Lobos	74	48	55.9	0.11	
Point Loma L. H.	.....	.....	.....	0.07	
Point Montara L. H.	.....	.....	.....	1.15	
Point Pinos L. H.	.....	.....	.....	0.67	
Point Reyes L. H.	.....	.....	.....	0.41	
Point Sur L. H.	.....	.....	.....	0.92	
Pomona (near)	96	40	66.6	0.08	
Portersville*§	96	46	67.8	0.23	
Poway*§	92	50	59.4	0.25	
Quincy†	77	25	50.8	0.44	
Ravenna*§	100	42	63.8	0.72	
Redding *b*†	90	41	66.2	0.01	
Reedley (near)*[1]	94	48	68.6	0.20	
Represa	84	44	63.7	0.07	

TABLE II.—*Meteorological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
California—Cont'd.	°	°	°	*Ins.*	*Ins.*
Rio Vista	90	40	63.0	0.19	
Riverside†	100	39	66.0	T.	
Robertsons Mill	.....	.....	.....	0.20	
Roe Island L. H	.....	.....	.....	0.00	
Rosewood	90	35	62.0	0.97	
Sacramento	86	42	62.8	0.27	
Salton*[8]	108	60	82.7	T.	
San Bernardino†	99	38	64.6	0.00	
San Jose *b*	84	38	58.4	0.83	
San Leandro*[1]	92	52	62.5	0.26	
San Luis L. H	.....	.....	.....	0.99	
San Luis Obispo *a*	.....	.....	.....	1.67	
San Mateo*[8]	86	51	61.7	0.33	
San Miguel*[8]	90	36	62.6	0.56	
San Miguel Island	83	46	60.3	1.27	
San Rafael	86	39	59.8	0.15	
Santa Ana*[5]	88	60	72.8	0.00	
Santa Barbara *a*	88	48	63.4	0.55	
Santa Barbara L. H	.....	.....	.....	0.45	
Santa Clara *a*[8]	92	44	61.3	0.49	
Santa Clara *b*	94	40	62.5	0.54	
Santa Cruz *b*†	86	40	61.2	0.49	
Santa Cruz L. H	.....	.....	.....	0.25	
Santa Maria	84	47	61.8	0.65	
Santa Monica*[8]	85	58	63.5	0.18	
Santa Paula *b*	85	44	61.2	.....	
Santa Rosa*[8]	81	45	59.6	0.00	
Shasta	.....	.....	.....	0.12	
Shasta Springs	85	26	56.4	0.00	
Sneddens Ranch	.....	.....	.....	0.16	
S. E. Farallone L. H	.....	.....	.....	0.12	
Stanford University	86	40	59.6	0.67	
Stockton *a*	87	39	63.0	0.26	
Summerdale†	.....	.....	.....	0.79	
Susanville†	79	33	55.4	0.10	
Sutter Creek*[5]	85	34	59.4	0.08	
Tecarte Dam*[4]	92	32	55.0	0.63	
Tehama*[8]	90	42	63.7	.....	
Tejon Ranch	.....	.....	.....	2.13	
Templeton*[8]	92	35	60.7	1.14	
Trinidad L. H	.....	.....	.....	0.00	
Truckee*[8]	74	22	47.6	0.34	
Tulare *b*	.....	.....	.....	0.51	
Tulare *c*	98	38	66.1	0.43	
Turlock *b*†	96	32	64.0	0.21	
Ukiah†	88	33	59.9	0.21	
Upper Lake	94	35	63.0	T.	
Upper Mattole*[1]	89	40	57.2	0.00	
Vacaville*[1]	93	42	66.4	0.06	
Ventura†	90	47	63.2	0.10	
Volcano Springs*[8]	108	60	79.7	0.00	
Wenrich Ranch	.....	.....	.....	0.36	
West Point	.....	.....	.....	0.85	
Wheatland	89	40	63.4	0.10	
Williams*[6]	91	42	65.0	0.13	
Willows *b*[8]	88	42	67.8	1.29	
Wilmington*[8]	80	57	69.6	0.00	
Wire Bridge*[5]	88	38	63.3	0.14	
Yerba Buena L. H	.....	.....	.....	0.00	
Yreka†	83	25	55.8	T.	
Yuba City*[5]	82	53	66.8	0.06	
Colorado.					
Alma†	61	7	33.6	2.60	5.5
Antlers†	80	18	48.2	1.03	
Arkins	.....	.....	.....	1.15	T.
Boxelder	.....	.....	.....	1.54	1.0
Breckenridge†	77	0	41.2	1.95	19.5
Brush	82	13	50.2	0.00	
Byers*[1]	77	19	48.8	.....	T.
Canyon†	80	22	52.2	2.38	
Capps	.....	.....	.....	0.20	
Castle Rock†	75	13	46.8	1.16	
Climax†	55	8	32.6	1.60	16.0
Collbran	.....	.....	.....	1.13	
Colorado Springs†	74	18	47.0	1.66	T.
Craig	.....	.....	.....	0.15	
Crook	82	21	49.6	0.10	
Deer Trail*[8]	71	19	49.2	.....	
Delta†	85	19	54.4	0.43	
Denver	.....	.....	.....	.....	2.2
Divide Exper. Station	73	11	43.8	1.14	T.
Downing†	86	20	55.0	0.62	0.2
Dumont†	.....	.....	.....	2.38	6.0
First View*[6]	80	25	52.1	.....	
Fleming	.....	.....	.....	0.10	
Fort Collins†	80	15	46.8	1.06	
Fox	.....	.....	.....	0.00	
Garnett	.....	.....	.....	1.10	
Glen Eyrie†	70	21	47.4	1.93	
Gold Hill*[1]	77	24	47.1	2.71	9.5
Grand Junction†	78	30	53.9	0.92	
Gulch	68	17	42.0	1.33	2.5
Gunnison†	78	5	41.9	1.33	T.
Holly	.....	.....	.....	0.22	T.
Holyoke *a*	.....	.....	.....	0.16	
Holyoke *b*	.....	.....	.....	0.15	
Colorado—Cont'd.					
Hugo*[5]	77	29	49.2	0.65	0.5
Hugo (near)†	74	15	45.6	0.15	
Husted	81	13	47.2	1.75	T.
Jamestown	66	13	42.1	2.15	8.8
Julesburg†	82	18	47.0	0.25	
Kit Carson*[1]	86	27	49.2	.....	
La Jara†	76	18	47.6	1.25	2.5
Lake Moraine†	58	11	36.3	1.65	22.0
Lamar†	85	18	52.9	0.18	
Laporte	.....	.....	.....	1.09	
Las Animas†	86	18	53.4	0.35	
Lay*†	74	16	42.2	0.57	
Leadville (near)*[5]	85	14	44.8	0.58	6.0
Le Roy†	78	11	48.8	0.11	
Livermore (near)	.....	.....	.....	1.40	.....
Longmont†	79	18	46.6	1.27	1.0
Longs Peak	.....	.....	.....	2.60	11.0
Loveland	.....	.....	.....	0.96	
Manhattan	.....	.....	.....	0.80	10.0
Meeker†	75	14	44.6	1.48	
Millbrook†	76	12	42.5	2.01	2.0
Minneapolis†	83	22	52.7	0.28	
Monte Vista	72	16	44.0	1.17	
Montrose	86	25	54.2	1.23	
Moraine†	67	15	41.4	2.30	14.5
Ouray†	78	30	50.0	0.61	T.
Pagoda	78	11	44.1	1.25	T.
Paonia	.....	.....	.....	0.90	
Parachute†	77	15	50.7	0.71	
Pinkhamton	.....	.....	.....	0.67	5.0
Rangely†	80	14	45.8	0.87	
Redcliff	.....	.....	.....	0.20	2.0
Rico	.....	.....	.....	0.20	2.0
River Bend*[5]	80	20	52.6	.....	T.
Rocky Ford†	82	16	51.4	0.85	
Saguache†	70	23	46.0	1.93	
St. Cloud†	.....	.....	.....	2.55	5.5
San Juan†	70	7	36.4	1.67	7.5
San Luis†	83	9	45.8	1.63	5.5
Santa Clara*†[1][7]	67	22	40.9	1.30	
Seibert†	.....	.....	.....	0.13	
Smoky Hill Mine†	78	14	45.4	2.60	8.0
Stamford*[1]	72	16	36.8	2.60	
Surface Creek†	73	24	48.0	1.45	
Thon†	85	15	49.8	0.07	T.
T. S. Ranch†	79	27	51.2	1.30	
Twin Lakes	.....	.....	.....	1.04	6.0
Vilas	.....	.....	.....	0.26	
Watkins*[1]	78	34	56.3	.....	T.
Wray	86	14	49.6	T.	
Yuma	.....	.....	.....	0.10	
Connecticut.					
Bridgeport	72	27	48.6	4.41	
Canton†	68	20	45.1	6.15	T.
Colchester	69	22	46.3	6.77	T.
Falls Village	.....	.....	.....	5.38	T.
Greenfield Hill	.....	.....	.....	3.58	
Hartford *b*	.....	.....	.....	5.12	T.
Hartford *c*	68	28	47.5	.....	
Lake Konomoc	.....	.....	.....	4.58	
Middletown	69	23	47.9	4.04	
New London†	70	27	49.5	4.71	
North Franklin	.....	.....	.....	5.25	
North Grosvenor Dale	66	20	43.2	9.12	T.
Norwalk	69	23	45.8	3.96	
Southington*[1]	66	21	45.6	4.05	
South Manchester	.....	.....	.....	6.47	
Storrs	65	20	44.8	6.74	T.
Thompson*[1]	66	23	45.3	.....	
Voluntown†	70	20	47.2	6.14	
Wallingford†	.....	.....	.....	5.83	
Waterbury	71	23	47.6	5.19	
West Simsbury	.....	.....	.....	5.66	T.
Windsor	66	23	45.5	5.29	T.
Delaware.					
Dover†	70	32	51.0	3.14	
Kirkwood*[2][4]	.....	.....	47.4	.....	
Milford	80	30	54.1	2.42	
Millsboro	74	29	51.4	3.06	
Newark	74	27	49.8	2.53	
Seaford†	73	30	52.1	2.76	
Wilmington†	77	33	53.1	2.74	T.
District of Columbia.					
Dist'ing Reservoir*[5]	70	29	51.4	0.72	
Receiving Reservoir*[5]	69	31	51.3	0.72	
West Washington	77	28	52.6	1.84	T.
Florida.					
Amelia†	87	48	68.6	0.88	
Archer†	91	46	70.9	1.02	
Avon Park†	92	57	75.2	4.83	
Bartow†	87	52	72.0	2.36	
Brooksville†	87	54	71.6	1.93	
Clermont†	89	58	72.0	2.97	
Earnestville†	88	55	72.2	3.71	
Eustis†	89	56	72.3	1.05	
Federal Point†	88	52	70.0	1.22	
Florida—Cont'd.					
Fort Meade†	86	49	70.3	2.98	
Frostproof*†[1]	89	59	72.6	5.35	
Gainesville†	88	51	69.6	0.64	
Grasmere†	89	56	72.4	2.93	
Green Cove Springs†	87	46	67.3	0.86	
Hypoluxo†	.....	.....	.....	24.39	
Kissimmee†	92	56	74.9	5.40	
Lake City†	87	49	69.8	0.40	
Manatee†	89	51	71.8	2.00	
Merritts Island†	87	62	75.2	6.59	
Milton	.....	.....	.....	3.00	
Mullet Key†	84	64	74.4	1.86	
Myers†	87	59	74.6	2.23	
New Smyrna	86	54	71.4	3.63	
Oak Hill*[1]	84	64	76.3	.....	
Ocala*†[1]	83	51	70.9	0.80	
Orange City	87	55	73.1	2.14	
Orange Park	87	45	68.3	0.61	
Orlando†	90	58	73.9	3.78	
Plant City†	90	51	72.4	2.61	
St. Francis	90	59	72.8	.....	
St. Francis Barracks	88	54	69.8	0.76	
Tallahassee†	84	54	67.0	1.96	
Tarpon Springs†	87	55	72.0	2.35	
Georgia.					
Adairsville†	81[6]	31[6]	56.4[6]	0.61[4]	
Alapaha†	89	44	65.2	0.58	
Albany†	90	40	64.8	1.69	
Americus†	82	38	61.8	0.59	
Athens *a*	81	37	58.6	1.27	
Athens *b*†	84	34	58.5	1.05	
Bainbridge *a*†	89	33	64.4	1.27	
Bainbridge *b*†	.....	.....	.....	1.29	
Blakely†	90	43	66.5	1.00	
Brunswick	85	50	68.4	.....	
Camak†	88	30	59.6	0.87	
Canton†	.....	.....	.....	2.07	
Clayton†	79	25	50.6	2.41	
Columbus†	92	40	62.5	0.57	
Cordele†	87[4]	38[4]	64.4[4]	0.35	
Covington	84	34	58.5	1.59	
Dahlonega†	80	34	56.6	2.09	
Diamond†	77	29	52.8	2.18	
Dublin *b*†	.....	.....	.....	0.42	
Eastman†	92	40	63.8	0.24	
Elberton†	88	38	61.8	0.68	
Fleming†	92	38	63.0	1.64	
Forsyth*[1]	90	46	65.4	1.60	
Fort Gaines†	86	40	63.0	1.45	
Gainesville†	78	34	56.4	0.40	
Gillsville†	86	33	60.0	1.23	
Griffin†	84	42	61.6	1.90	
Hawkinsville†	.....	.....	.....	2.80	
Hephzibah*[6]	82	44	63.2	0.60	
Lagrange†	87	36	59.8	2.45	
Louisville†	84[6]	34[6]	60.9[6]	0.55	
Lumpkin	90	44	66.0	0.90	
Macon *b*†	88	34	59.8	0.40	
Marietta†	81	37	58.0	1.54	
Marshallville†	90	41	64.6	0.45	
Milledgeville†	84	36	62.4	1.15	
Millen†	91	34	62.7	0.26	
Morgan†	90	38	64.0	1.65	
Newnan†	84	31	59.0	2.39	
Piscola[4]	89	47	68.2	0.67	
Point Peter*[1]	84	26	58.8	0.85	
Poulan†	91	38	64.6	2.33	
Quitman†	88	45	65.7	0.12	
Ramsey†	82	29	56.8	2.54	
Resaca†	.....	.....	.....	2.39	
Reynolds†	.....	.....	.....	0.80	
Rome†	81	32	56.3	2.59	
Talbotton†	84	40	61.2	1.24	
Thomasville†	90	44	67.5	0.07	
Toccoa†	83	34	56.6	0.99	
Union Point†	88	40	59.2	0.50	
Washington†	85	39	60.2	0.94	
Way Cross†	87	48	66.2	0.88	
Waynesboro†	89	36	60.6	0.24	
West Point†	86	32	59.4	1.59	
Whitesburg†	.....	.....	.....	1.64	
Idaho.					
American Falls†	77	13	46.8	0.32	
Atlanta†	.....	.....	.....	0.00	
Bannister†	70	33	53.6	0.00	
Bliss†	92	22	51.6	0.00	
Boise Barracks†	80	24	55.0	0.00	
Chesterfield†	87	3	41.4	0.05	T.
Cœur d'Alene	75	22	49.8	.....	
Corral*†[1]	73	14	45.9	0.00	
Dairy†	76	29	53.4	0.00	
Fort Lemhi	71	19	44.2	0.04	
Fort Sherman†	77	22	48.4	0.14	
Fraser†	74[6]	25[1]	51.1[5]	0.04	
Gibbonsville†	71	16	43.5	0.00	
Grangeville	75	29	51.0	0.24	

TABLE II.—*Meteorological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Idaho—Cont'd.	°	°	°	*Ins.*	*Ins*
Hailey†	82	24	53.8	0.00	
Idaho City†	95°	17°	52.8°	0.00	
Kootenai	72	20	47.4	0.00	
Lewiston†	85	21	52.2	0.04	
Lost River†	.....	.....	.....	T.	
Martin†	69	15	43.5	0.00	
Moscow†	74	21	45.2	T.	
Murray†	71	19	44.8	0.32	
Nampa	84	21	52.4	0.00	
Oakley†	79	24	50.6	T.	
Paris†	81	11	47.7	0.14	
Payette†	85	16	53.6	0.00	
St. Anthony	80	13	48.4	0.11	
Salubria†	82	15	51.2	T.	
Soldier†	82	12	50.4	0.00	
Swan Valley†	80	5	43.5	0.41	
Warren†	80	14	47.7	0.30	
Illinois.					
Albion†	80	22	51.4	0.96	
Alexander†	78	12	50.2	0.28	
Altamont	76	.....	.....	.....	
Ashton*†	73	10	42.3	0.77	
Atlanta	.....	.....	.....	0.50	
Atwood *a*[2]	80	16	48.6	0.24	
Atwood *b*	.....	.....	.....	0.15	
Aurora† *b*	76	12	45.0	1.11	
Beardstown†	.....	.....	.....	1.15	
Bloomington†	79°	16	47.6	0.61	
Bushnell†	78	18	49.6	0.71	
Cambridge	78	20	47.2	0.75	
Carlinville†	76	20	50.8	0.42	
Carlyle	.....	.....	.....	0.55	
Carrollton	71	23	48.4	0.52	
Catlin†	75	.....	.....	0.49	
Cazenovia*[1]	76	22	44.9	0.74	
Chemung*[1]	74	12	44.5	0.66	T.
Chester†	.....	.....	.....	0.41	
Chicago	.....	.....	.....	.....	T.
Clear Creek†	80	11	47.0	1.24	
Coatsburg	74	28	50.3	0.34	
Cordova†	.....	.....	.....	0.70	
Decatur†	75	24	50.0	0.55	
Dixon†	75	14	45.8	0.82	T.
Duquoin*[1]	79	25	52.6	0.89	
East Peoria†	86	14	46.2	0.81	
Evanston*[10]	70	18	47.2	.....	
Flora*[1]	79	21	49.8	0.34	
Fort Sheridan†	71	17	44.1	0.41	
Friend Grove*†[4]	.....	26	49.6	0.26	
Galva†	75	15	48.0	0.87	
Gilman†	76	11	48.6	1.17	
Glenwood*†[1]	70	15	43.5	0.74	T.
Golconda	78	29	54.8	0.77	
Grafton†	.....	.....	.....	0.58	
Greenville†	80	21	50.4	0.77	
Griggsville†	76	20	51.3	0.35	
Halliday*[5]	76[3]	21[4]	52.8[4]	0.55	
Havana†	75	23	49.9	0.41	
Herrins Prairie*[1]	72	34	54.9	0.20	
Hillsboro*†[1]	78	24	51.6	0.63	
Iron	79	23	51.4	0.33	
Joliet†	79	19	48.4	0.67	
Jordans Grove†	79	20	52.5	0.41	
Kankakee *a*†	71	20	47.8	1.52	
Kankakee *b*†	78[4]	21[4]	48.2[4]	.....	
Knoxville*[5]	76	18	47.7	1.00	
Lagrange	71	14	45.0	0.77	
La Harpe*[1]	78	18	47.6	0.34	
Lanark*[1]	72	8	43.0	0.86	T.
Lexington*†[1]	72	19	45.8	0.76	
Loami	.....	.....	.....	0.35	
Louisville†	75	21	50.0	0.46	
McLeansboro*†[3]	.....	26	46.4	0.57	
Martinsville†	78	17	48.8	0.95	
Mascoutah*[5]	82	22	52.1	0.50	
Mattoon	79	28	52.4	0.60	
Minonk*[1]	79	16	46.0	0.87	
Monmouth†	77	13	48.5	0.78	
Morrisonville†	78	17	48.7	0.25	
Mount Carmel†	.....	.....	.....	0.43	
Mount Pulaski	83	19	50.4	0.31	
Mount Vernon	79	22	51.1	0.27	
New Burnside†	86	17	53.4	0.60	
Olney *a*[1]	78	24	51.4	0.13	
Olney *b*[1]	79	20	46.5	0.10	
Oswego*[1]	78	12	42.6	1.05	
Ottawa†	76	13	45.6	1.16	
Palestine†	79	22	47.2	0.57	
Paris†	82	21	49.2	0.28	
Peoria *a*†	.....	.....	.....	0.61	
Peoria *b*	75	25	48.6	0.67	
Philo†	77	12	46.6	0.85	
Plum Hill*†[3]	75	21	47.0	0.40	
Rantoul*†[1]	75	21	45.0	0.47	
Reynolds	76	16	46.6	0.65	
Riley†	70	18	43.6	0.41	T.
Illinois—Cont'd.	°	°	°	*Ins.*	*Ins.*
Rockford†	74	13	45.2	1.32	T.
Rose Hill	.....	.....	.....	0.05	
Rushville	84	19	51.2	0.53	
St. John*†[1]	78	23	51.8	0.83	
Scales Mound†	75	14	45.8	0.73	T.
Streator	75	15	47.3	1.00	
Sycamore*†[1]	71	10	43.8	0.55	T.
Tiskilwa*[3]	78	21	49.7	0.78	
Tuscola*†[1]	77	22	47.3	0.25	
Walnut†	78	17	48.4	0.64	
Wheaton*[2]	.....	16	39.0	1.16	
Winnebago†	73	11	43.8	0.80	T.
Zion†	71	15	44.2	0.93	T.
Indiana.					
Anderson†	71	15	47.2	0.75	
Angola*[1]	72	18	45.9	1.47	0.1
Ashboro†	79	20	48.6	0.54	
Bedford	77	23	48.5	0.20	
Bluffton *b*	76	10	45.2	0.85	
Butlerville†	75	18	48.2	0.76	
Cambridge City†	72	13	46.3	0.96	
Columbia City*[1]	70	12	44.7	1.29	
Columbus†	74	13	48.0	0.51	
Connersville†	73	14	46.2	0.57	
Delphi	75	18	47.9	0.76	
Edwardsville*†[1]	75	26	52.6	0.90	
Evansville†	83	17	49.4	0.76	
Farmland†	70[b]	16[b]	45.7[b]	0.68	
Franklin*[1]	74	19	47.0	0.37	
Greencastle	87	24	48.0	0.46	T.
Huntingburg†	77	20	48.6	0.35	
Huntington	73	15	45.6	0.91	T.
Jasper†	78	17	49.6	0.65	
Jeffersonville	77	24	51.4	0.81	
Kokomo†	73	18	46.8	1.02	
Laconia	76	21	50.1	0.70	
Lafayette†	75	16	47.2	0.70	
Logansport *a*†	.....	.....	.....	1.09	
Logansport *b*	76	18	48.0	1.04	
Lyford†	78	14	48.1	0.48	
Madison†	77	22	51.5	0.87	
Marion†	72	15	46.8	0.91	
Mauzy†	73	15	45.8	0.63	
Mount Vernon†	78	27	52.0	0.80	
Princeton*†[1]	73	21	51.9	0.50	
Rockville†	76	18	46.6	0.61	
Scottsburg*[1]	78	18	47.9	0.88	
Seymour†	78	23	49.7	0.20	
South Bend†	75	17	46.5	1.49	
Sunman	72	18	46.7	0.58	
Syracuse	.....	.....	.....	1.59	
Terre Haute†	75	20	51.8	0.63	
Topeka†	70	11	46.0	0.12	T.
Valparaiso†	74	18	45.2	0.53	T.
Vevay	78	18	50.2	0.60	
Vincennes†	79	14	47.5	.....	
Worthington†	75	18	48.8	0.65	
Indian Territory.					
Eufaula†	.....	.....	.....	0.80	
Healdton†	89°	30°	60.0°	2.31	
Kemp†	86	31	60.4	1.22	
Lehigh†	94	21	58.6	T.	
Purcell†	86	33	58.7	3.15	
Tahlequah	87	26	58.4	2.40	
Tulsa†	.....	.....	.....	1.60	
Vinita†	78	27	56.8	0.40	
Iowa.					
Afton	75	15	47.9	0.50	
Algona*[1]	72	16	44.3	0.45	T.
Alta†	74	11	45.2	0.32	
Amana†	72	9	44.4	1.07	
Ames *b*	74	10	49.3	0.47	
Ames *c*	.....	.....	.....	0.77	
Atlantic†	78	8	45.3	0.30	
Atlantic (near)	74	11	48.3	0.15	
Audubon	73	8	44.3	0.02	
Belknap	77	12	46.6	0.15	
Belle Plaine	75	8	44.6	0.96	
Bonaparte†	79	16	49.0	0.23	
Carroll	75	10	42.7	0.30	
Cedar Falls†	77	9	46.1	0.50	
Cedar Rapids†	70	16	45.6	1.23	
Centerville	85	16	50.3	.....	
Chariton	73	16	48.0	0.10	
Charles City†	70	9	42.5	0.46	
Clarinda†	74	14	43.6	0.09	T.
Clinton	74	13	45.5	1.04	
Corning†	78	14	49.5	T.	
Cresco†	75	8	42.3	0.15	T.
Decorah†	76	6	42.8	0.00	
Delaware*[5]	80	13	40.5	0.85	T.
Denison†	79	9	45.4	0.18	
Elkader†	79	8	44.1	0.81	
Emmetsburg	79	9	43.6	0.28	T.
Estherville	78°	13°	45.4°	0.43	T.
Fairfield†	75	14	46.8	0.38	
Iowa—Cont'd.	°	°	°	*Ins.*	*Ins.*
Fayette	76	8	43.8	0.78	T.
Forest City	87	11	42.8	0.32	
Fort Madison*†[1]	75	24	50.6	0.47	
Galva†	76	11	43.7	0.27	
Garden Grove	76	10	45.7	T.	
Glenwood†	88	10	50.3	0.12	
Grand Meadow*[1]	68	17	44.0	0.76	0.2
Greenfield†	76	10	47.2	0.14	
Grinnell	71	17	47.2	0.79	
Grundy Center	76	11	44.7	1.17	T.
Guthrie Center	73	9	44.8	0.39	
Hampton	74	11	42.9	0.92	T.
Hawkeye	.....	.....	.....	0.49	0.1
Hopeville†	77	15	48.6	0.06	T.
Humboldt†	77	10	45.3	0.80	T.
Independence†	74	16	44.5	0.45	T.
Indianola	80	12	48.2	0.28	
Iowa City†	76	10	46.2	1.38	
Iowa Falls†	72	6	41.6	0.80	T.
Keosauqua†	78	14	50.6	T.	
Knoxville	76	15	47.6	0.40	
Larrabee†	77	7	44.9	0.24	
Le Claire†	.....	.....	.....	0.35	
Lenox*[1]	78	18	48.6	0.07	T.
Logan†	76	8	47.6	0.00	
Madrid	76	7	44.4	0.54	T.
Malvern	.....	.....	.....	0.18	
Marshall†	77	9	43.1	0.63	
Mason City†	73	.....	.....	0.53	T.
Maxon*[1]	78	18	48.3	T.	
Mechanicsville	72	15	45.3	1.13	
Monticello*†[1]	67	8	40.1	1.10	
Mooar	78	18	47.7	0.75	
Mount Ayr†	78	13	49.0	0.11	
Mount Pleasant*[1]	73	25	49.7	0.37	
Mount Vernon*[1]	74	18	45.7	1.20	
Neola	83	0	47.3	T.	
Newton†	74	15	46.4	0.69	
North McGregor†	.....	.....	.....	0.86	
Ogden	78	7	47.3	0.78	
Osage*†[3]	.....	14	39.2	0.33	T.
Oskaloosa†	78	11	46.4	0.42	
Ottumwa	78	15	49.2	0.90	
Ovid†	79	12	48.3	0.14	
Panama†	76	12	42.4	0.11	
Portsmouth	75	9	46.8	T.	
Primghar	75	8	45.4	0.24	
Rock Rapids	80	4	47.1	0.62	
Sac City†	75	19	44.8	0.25	
Seymour†	83	15	49.1	0.48	
Sibley	.....	8	.....	0.45	T.
Sidney	.....	16	.....	0.13	
Spirit Lake†	80	13	45.0	0.43	T.
Toledo	72	10	45.1	0.62	
Villisca†	78	8	45.8	0.15	T.
Vinton*[1]	75	9	44.5	0.87	T.
Washington†	78	14	47.1	0.67	
Waterloo	74	12	45.2	0.64	T.
Waukee	75	12	49.0	0.24	
West Bend*†[1]	72	10	42.5	0.37	
Williams	78	10	44.7	0.86	
Wilton Junction†	73	11	45.4	1.26	
Winterset	75	10	46.0	0.82	
Kansas.					
Abilene†	84	21	53.0	0.75	
Achilles*[5]	78°	12	50.0	0.65	6.0
Altoona*†[3]	80	28	48.0	0.15	
Atchison	82	20	52.0	0.20	T.
Baker	82	16	51.4	0.11	
Beloit†	81	21	50.0	1.02	0.5
Blaine	83	17	51.5	0.49	
Burlington†	85	24	51.8	0.51	T.
Campbell	84	16	52.7	0.41	
Colby†	79	12	48.8	0.35	2.0
Coldwater†	82	26	52.9	2.00	
Collyer*[5]	85	18	53.2	1.20	2.0
Columbus†	79	24	52.4	0.32	
Coolidge†	82	20	52.4	T.	
Cunningham†	84	22	53.6	1.98	T.
Downs	.....	.....	.....	0.69	T.
Dresden*†[1]	82	14	50.6	0.45	2.0
Elk City*[1]	81	27	53.7	0.05	
Ellinwood*[5]	77	22	52.0	1.51	
Emporia†	77	27	52.5	0.15	
Englewood†	87	24	53.0	1.83	
Eureka†	.....	.....	.....	0.40	
Eureka Ranch†	81	17	50.6	0.97	5.0
Fort Riley†	84	22	54.0	0.50	
Fort Scott	.....	.....	.....	0.45	
Frankfort	87	21	55.7	0.20	
Garden City†	83	20	51.8	1.06	
Garfield	.....	.....	.....	1.57	T.
Gibson*[1]	80	17	48.2	1.07	T.
Girard*[1]	81	27	53.4	0.27	
Goodland	80	17	50.2	0.40	T.
Gove*†[1]	84	20	51.2	0.70	4.0

TABLE II.—*Meteorological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Kansas—Cont'd.	°	°	°	*Ins.*	*Ins.*
Grainfield *6	88	20	57.4	0.40	4.0
Grenola *1	80[3]	28	51.4	0.30	
Halstead	78	24	51.6	1.32	T.
Hays	84	12	51.2	0.70	T.
Horton †	81	19	51.8	0.18	
Hutchinson †	87	27	56.2	1.66	
Independence	82	27	55.2	0.29	
Ionia †	80[e]	15[e]	50.5[e]	1.32	T.
Jaqua	83	11	48.7	T.	
Lawrence [1]	79[3]	24	51.9	0.31	T.
Lebo †	85	25	53.7	0.38	
Macksville †	84	23	54.9	2.15	
McPherson †	81	25	53.6	1.17	
Manhattan *b*	87	21	53.6	0.53	
Manhattan *c*				0.52	
Marion	80	23	53.0	0.84	
Meade †	86	27	56.3	1.37	
Medicine Lodge	78	29	52.5	1.60	
Minneapolis †	84	20	51.5	0.99	T.
Morland †	83	13	50.4	0.60	2.0
Morton †	83	22	52.9	0.41	
Mount Hope *1	82	30	55.0	1.46	
New England Ranch †	80	18	50.1	0.64	3.0
Norwich *† 1	86	30	58.1	0.99	
Oberlin †				0.76	6.0
Oswego † [f]	83	26	56.2	T.	
Ottawa †	82	27[d]	52.6[e]	0.20	
Paola †	83	20	55.0	0.00	
Phillipsburg †	82	14	51.0	0.65	1.0
Pleasant Dale	85	20	52.6	1.10	1.0
Rome *† 1	85	28	53.8	0.71	
Russell	84	19	52.4	1.08	1.2
Salina †	83	20	51.6	0.97	0.5
Sedan †	83	27	55.6	0.41	
Sharon Springs *1	86	30	55.0	0.50	
Tribune	80	24	52.6	0.66	
Ulysses				0.50	
Wakefield * 1	86	21	53.6	0.64	
Wallace *6	86	14	54.8	0.24	T.
Wamego *1	82	20	50.9	0.35	
Wellington *1	83	34	60.3	0.41	
Winfield *5	84	24	53.2	0.46	
Winona *5	80	32	59.6	0.10	1.0
Yates Center †	81	23	51.8	0.32	
Kentucky.					
Alpha †	85	27	55.4	3.60	
Anchorage	77	24	52.0	0.68	
Blandville †	79	22	53.0	0.84	
Bowling Green *a* *1	78	21	49.1	1.52	
Bowling Green *b* †	81	27	53.6	1.45	
Burnside †				2.70	
Caddo * † 1	88	24	47.3	0.80	
Canton *† 1	81	28	55.4	0.44	
Carrollton †	80	15	50.0	0.66	
Catlettsburg †				1.31	
Custer †	80	24	52.2	0.37	
Earlington	81	24	53.7	0.90	
Edmonton †	77	26	51.4	2.69	
Falmouth †				0.84	
Fords Ferry †	82	21	52.7	0.89	
Frankfort †	77	20	50.2	1.11	
Franklin *† 1	83	32	55.9	2.52	
Georgetown	77	19	50.8		
Greendale *1	76	24	50.9	1.34	
Greensburg *† 1	79	22	49.3	2.06	
Harrods Creek †	84[e]	26[e]	58.0[e]	0.79	
Henderson †	80	26	54.6	1.06	
Leitchfield				1.04	
Louisa †	77	30	48.6	1.21	
Marrowbone †	81	30	51.6	2.58	
Mount Sterling †	77	23	49.2	1.73	
Paducah *a* †				1.04	
Paducah *b* †	83	29	55.8	0.88	
Pleasure Ridge Park †	81	14	49.4	0.65	
Princeton †	85	30	50.9	0.40	
Richmond	78*	21	54.9	0.32	
Russellville †	86	25	55.8	1.95	
Sandy Hook †	80	15	50.0	1.50	
Shelby City *1	80	25	53.1	1.68	
Shelbyville †	83	18	50.5	1.18	
South Fork † [2]			44.3	2.18	
Springfield [g]	82	20	51.6	1.00	
Williamsburg †				3.10	
Louisiana.					
Abbeville	89	41	66.0	5.01	
Alexandria †	90	35	62.4	1.74	
Amite †	93	36	64.1	2.67	
Ashwood	88	39	61.4	1.43	
Bastrop †	88	33	60.9	1.24	
Baton Rouge †	90	41	65.6	4.93	
Calhoun †	90	34	60.4	1.65	
Cameron	92	42	68.3	5.70	
Cheneyville †	89	36	61.2	1.98	
Clinton †	94	38	63.9	3.37	
Coushatta *a* †				5.81	
Coushatta *b* †	91	36	60.6	5.95	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Louisiana—Cont'd.	°	°	°	*Ins.*	*Ins.*
Covington †	90	36	64.4	2.77	
Davis	89	30	58.8	2.40	
Delhi †				3.13	
Donaldsonville †	90	46	67.4	2.89	
Elm Hall	87	39	63.2	3.19	
Emilie †	86	41	65.8	2.27	
Farmerville	89	35	59.9	1.83	
Franklin †	88	41	65.6	4.85	
Grand Coteau	85	46	64.3	6.38	
Hammond †	86	38	63.7	2.97	
Houma	89	41	66.2	0.94	
Jeanerette † *	90	43	66.6	4.29	
Lafayette †	92	40	64.6	3.64	
Lake Charles †	89	46	66.0	3.26	
Lake Providence †	93	37	62.8	1.34	
Lawrence †	89	51	69.0	1.75	
Liberty Hill	95	35	62.6	3.18	
Maurepas	92	38	65.2	2.37	
Melville †	89	40	63.8	5.00	
Minden †	91	38	62.1	2.79	
Monroe †	88	36	61.2	1.40	
Natchitoches †	93	36	61.6	1.86	
New Iberia	87	43	64.9	4.25	
Oak Ridge †	93	32	60.2	1.11	
Oberlin	88	34	62.5	3.60	
Opelousas †	94	38	64.3	4.35	
Oxford †	88	34	60.2	4.06	
Paincourtville †	89	40	65.8	3.08	
Plain Dealing	87	39	59.8	2.25	
Rayne †	93	42	65.4	3.31	
Ruston	89	30	63.7	2.83	
Schriever †	90	40	66.2	1.69	
Shell Beach	86	47	66.0	4.46	
Southern University †	87	45	66.0	1.80	
Sugar Ex. Station †	86	47	66.8	1.45	
Sugartown †	87	45	65.1	2.81	
Thibodeaux				1.67	
Toledo	93	43	69.4	8.82	
Trinity	88	41	63.0	1.35	
Wallace	86	43	67.0	2.11	
West End				1.32	
White Sulphur Springs †				1.72	
Maine.					
Bar Harbor	70	21	45.2	1.42	
Belfast *6	67	26	45.6	1.82	
Calais †	66	19	45.2	3.66	T.
Cornish *1	69	20	42.8	3.29	
Eastport					0.3
Fairfield	69	12	43.8	1.58	
Farmington †	77	13	42.7	1.99	3.2
Flagstaff † [d]				1.06	
Gardiner	70	19	44.8	1.82	
Houlton †	72	13	40.0	1.70	T.
Kineo †	65	22	42.1	0.87	
Lewiston	72	20	44.0	2.11	0.1
Mayfield	68	15	39.9	2.25	0.5
North Bridgton	67	22	44.6	2.91	2.5
Orono †	73	13	42.5	1.51	
Petit Menan *1	59	30	46.6		
West Jonesport *1	66	19	44.7		
Winslow				2.04	
Maryland.					
Annapolis	76	33	54.4		
Bachmans Valley *1	71	30	47.5	2.23	T.
Baltimore					T.
Boettcherville *7	76	18	47.7	1.10	
Cambridge	72	37	54.3	2.76	
Charlotte Hall †	76	23	51.0	2.56	
Cherryfields † 2			53.4	3.07	
Chestertown	74	30	51.4	2.75	
College Park	77	26	52.4	1.89	
Cumberland *a* †	72	22	48.8	1.20	
Cumberland *b*	74	28	54.2	1.20	
Darlington †	73	28	49.2	2.82	
Deer Park	69	4	41.2	0.99	
Denton	81	27	53.9	2.74	
Easton †	74	28	51.8	2.70	
Ellicott City	72	36	55.8	1.80	
Fallston *1	70	30	49.8	2.04	T.
Frederick *a*	74	25	50.2	1.54	
Frederick *b*	72	28	50.9		
Grantsville	70	17	44.3	1.22	
Great Falls * 5	71	28	51.0	0.44	
Green Spring Furnace	78	20	48.7	1.49	
Hancock	79	19	50.0	1.32	
Jewell †	82	31	52.9	2.35	
Johns Hopkins Hospital	74	31	52.0		
La Plata	75	28	52.1	1.50	
Laurel	74	21	49.4	2.30	
Lisbon	73	27	51.7	2.09	
McDonogh [e]	73	32	51.4		
Mardela Springs † *	73	29	52.0	3.59	
Mt. St. Marys College *1	72[d]	32[e]	51.4[d]	1.65	
Oakland †	72	9	42.6	1.51	T.
Pocomoke City	74	33	55.5	2.76	
Princess Anne	76	23	51.2	2.71	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Maryland—Con'd.	°	°	°	*Ins.*	*Ins.*
Sharpsburg	76	22	49.5	1.32	
Solomons †	77	35	56.4	3.04	
Sunnyside	70	10	43.8	1.61	T.
Upper Marlboro †	75	26	50.8	2.42	
Western Port	75	16	45.6	1.30	
Westminster	76	30	54.3	2.40	T.
Woosdtock	70	23	48.2	2.16	
Massachusetts.					
Adams	75	25	44.8		
Amherst	66	20	44.3	4.94	
Amherst Ex. Station *b*	71	20	47.1	4.77	
Andover	75	19	45.5	5.83	
Ashland				10.13	
Attleboro				6.60	
Bedford	68	21	45.2	7.21	
Beverly Farms	68	26	46.4	9.06	
Blue Hill (summit)	70	29	46.6	7.93	T.
Blue Hill (valley)	70	20	45.0	7.61	
Boston *a*				9.08	
Brockton *a*	70	25	47.7	5.37	T.
Brockton *b*				6.04	
Brockton *c*				6.55	
Cambridge *a*	71	23	48.4	10.00	
Cambridge *b*	71	26	46.7	10.16	
Chestnut Hill	71	21	47.4	9.24	
Clinton				9.55	
Cohasset				8.47	
Concord †	70	18	45.1	6.80	
Dudley [1]	68*	24	45.7	3.50	
East Templeton *1	63	26	43.1	4.08	T.
Egg Rock, Nahant	65	33	47.8		
Fall River	70	32	49.7	5.88	
Fiskdale				7.21	T.
Fitchburg *a* *1	64	25	43.6	7.10	
Fitchburg *b*	69	20	44.3	7.86	
Framingham	69	22	47.0	11.33	
Groton	67	18	44.6	7.54	
Hadley	69	16	44.4	3.87	
Hingham				7.04	
Hobbs Brook				9.87	
Hyannis *1	73	28	52.2	2.77	T.
Hyde Park *6		22	45.0		
Lake Cochituate	71	19	46.0	9.57	
Lawrence	69	22	46.7	6.10	
Leeds	65	20	43.5	6.71	
Leicester	65	23	44.8	7.64	
Leominster				6.71	T.
Long Plain *6	71	23	46.2	6.04	
Lowell *a*	69	21	46.3	6.67	
Lowell *b*	70	18	45.7		
Lowell *c*	74	24	48.8		
Ludlow Center	65	20	41.2	6.65	
Lynn *b*	68	26	47.8		
Mansfield *1	71	17	44.7	8.92	T.
Middleboro	73	18	46.2	6.14	T.
Milton	68	24	46.8	9.94	
Monroe	62	18	39.6	3.49	6.0
Monson	67	20	45.1	7.25	T.
Mount Nonotuck				4.76	
Mount Wachusett				6.29	
Mystic Lake				10.69	
Mystic Station				10.75	
Natick *1	67	26	46.3	8.72	
New Bedford *a*	67	30	49.0	4.29	
New Bedford *b*	68	23	48.3	4.04	T.
North Billerica	70	22	47.0	7.74	T.
Pittsfield	68	22	43.2	2.23	
Plymouth *1	68[1]	25[d]	49.4[f]	6.89	
Provincetown	68	27	49.6		
Roberts Dam				8.42	
Roxbury	70[d]	28[d]	48.6[d]	7.21	
Salem				9.10	T.
Salisbury				6.07	
Somerset *1	74	26	50.0	6.51	T.
Springfield Armory	68	20	44.2	6.20	
Taunton *b*	70	21	46.2	4.51	T.
Taunton *c*	71	17	45.3	6.61	T.
Turners Falls	64	24	44.7	2.78	
Wakefield †	68	20	46.0	7.00	
Waltham				11.08	
Webster				7.13	T.
Westboro †	70	20	46.9	9.79	
Williamstown *1	66	29	43.6	3.74	
Winchendon				4.19	
Winchester				9.70	
Woods Hole					T.
Worcester *a*	66	20	48.3		
Worcester *b*	65	26	46.2	8.02	
Michigan.					
Adrian	75	15	45.0	1.23	T.
Albion	67	23	45.0	1.21	
Allegan	70	20	45.4	0.65	T.
Alma	70	14	42.8	0.54	2.0
Alpena					3.9
Ann Arbor	67	19	45.0	0.34	T.
Arbela	71	19	44.4	0.41	0.5

TABLE II.—*Meteorological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Michigan—Cont'd.	°	°	°	*Ins.*	*Ins.*
Ball Mountain	68	16	41.9	0.52	0.3
Battle Creek	69	22	44.1	1.11	0.4
Benton Harbor	70	23	46.9	0.14	T.
Berlin *[1]	76	15	43.4	0.46	0.1
Berrien Springs *[1]	73	20	45.6	1.00	0.5
Birmingham	75	19	43.6	0.67	
Bois Blanc *[10]	70	26	45.7		
Boon†	60	5	37.0	1.84	10.4
Bronson	71	17	44.8	1.04	0.2
Calumet	65	21	39.5	0.84	2.8
Charlevoix	70	28	45.6	0.50	1.5
Cheboygan	70	15	40.7	1.89	6.0
Climax				0.70	
Clinton	76	15	44.8	0.70	
Crisps *[10]	77	25	41.6		
Detroit					0.1
Fairview	77	20	44.6	0.62	T.
Fitchburg	70	15	42.2	1.09	0.2
Flint	79	11	41.9	0.52	0.3
Grand Haven					0.1
Grand Point au Sable *[10]	60	25	47.6		
Grand Rapids	74	20	43.3	0.59	0.4
Grape	70	20	46.6	0.74	0.2
Grayling	68	7	40.9	2.25	20.0
Grindstone City *[10]	64	29	42.8		
Hanover	68	14	45.9	1.63	0.8
Harbor Springs	67	28	42.0	0.62	
Harrisville	72	22	43.0	0.79	3.1
Hart				0.25	T.
Hastings	78	20	43.4	0.80	0.7
Hayes	68	26	44.4	0.80	
Hesperia	70	19	45.4	0.13	1.0
Holland *[10]	71	30	49.4		
Howell	73	14	43.8	0.75	T.
Ivan	68	12	41.2	2.22	14.0
Jeddo	69	19	43.1	0.49	
Kalamazoo	70	24	44.8	1.13	0.2
Lansing	69	18	43.1	0.87	T.
Lathrop *[1]	70	10	38.8	1.19	7.8
Lewiston	70	18	40.9	1.26	
Madison	70	17	43.2	0.94	0.2
Marquette					10.9
Mayville	72	18	44.2	0.33	1.0
Middle Island *[10]	65	28	45.8		
Mottville	75	12	45.0	0.63	0.5
Mount Pleasant	69	14	43.2	0.47	2.2
Muskallongee Lake *[10]	62	23	40.7		
North Manitou Island	70	22	45.8		
North Marshall	69	18	41.4	1.34	T.
Northport	66	19	43.4	2.15	10.0
Old Mission	69	24	44.8	1.82	8.9
Olivet	68	21	44.2	1.20	T.
Ottawa Point *[10]	72	26	45.4		
Ovid	64	16	42.4	0.68	T.
Parkville				1.30	1.0
Point aux Barques *[10]	75	22	46.4		
Pontiac	68	15	44.2	0.45	
Port Huron					T.
Rockland	66°	16°	36.5°	2.30	7.5
Romeo	69	18	44.3	0.90	T.
St. Ignace	65	16	40.5	1.57	1.0
St. Johns	71	20	45.2	0.59	0.2
Sand Beach *a*	74	18	44.5	0.77	4.0
Sand Beach *b* *[10]	64	25	45.3		
Saranac	69	15	43.0	0.32	T.
Sault Ste Marie					19.7
Ship Canal *[10]	70	26	41.3		
Somerset	70	15	42.4	0.74	0.5
South Haven	69	24	45.5	0.47	T.
Stanton	69	14	42.4	0.56	1.5
Sturgeon Point *[10]	62	30	44.5		
Thornville	80	22	44.6	0.82	
Three Rivers		20		1.09	T.
Thunder Bay Island *[10]	62	26	44.4		
Two Heart River *[10]	66	24	40.2		
Vandalia	71	21	45.7	1.15	0.5
Vermillion Point *[10]	60	20	35.8		
Ypsilanti	72	12	43.5	0.60	0.2
Minnesota.					
Ada	79	−1	38.7	0.37	0.1
Albert Lea†	72	11	43.4	0.50	T.
Alexandria *a* †				0.06	0.5
Beardsley†	80	4	45.0	0.68	1.0
Bellepiaine				T.	
Bird Island	78	5	42.8	T.	T.
Blooming Prairie†	70	8	42.6	0.25	T.
Bonniwell†	75	12	44.0	T.	
Caledonia†	70	13	42.4	0.55	T.
Cambridge†	71	12	40.9	0.10	1.0
Camden†	74	10	43.8	0.23	T.
Clear Lake†	79	9	40.7	0.07	0.5
Clear Water *[1]	71	15	40.7	0.00	
Collegeville	75	14	44.8	T.	T.
Crookston†	78	9	40.7	0.40	
Dawson *[1]	80	2	41.3	T.	T.
Duluth†					0.3
Farmington†	72	10	42.1	0.27	T.
Fergus Falls†	73	7	41.8	0.10	0.7
Glencoe†	74	9	42.4		
Glenwood	74	8	41.5	0.07	T.
Grand Meadow†	76	11	40.5	0.30	T.
Grand Portage†	58	12	32.4	0.87	
Granite Falls	78[x]	8[x]	41.7[x]	T.	T.
Hutchinson†	72	8	41.8	T.	T.
Koochiching *[4]	65	12	38.7	0.60	5.5
Lake Winnibigoshish *[1]	69	14	35.7	0.28	
Lawrence†	69	7	43.1	0.10	1.0
Leech Lake[1]	70°	5	37.7	0.18	0.8
Long Prairie†	69	8	39.7	0.04	T.
Luverne†	75	10	42.6	0.35	
Maple Plain	73	13	42.4	0.10	0.4
Mazeppa[1]	70°	4	41.7	0.90	
Milan†	80	2	44.0	0.10	1.0
Minneapolis *a* †	71	14	43.2	0.09	0.5
Minneapolis *b*[1]	70°	11	41.5	0.08	0.5
Minneapolis (W. B)					0.4
Minnesota City†	70	10	43.4	0.55	T.
Montevideo†	79	8	45.8	T.	T.
Moorhead					1.6
Morris†	75	1	43.0	T.	T.
Mount Iron†	68	5	37.2	0.50	12.0
New London	78	10	43.0	T.	T.
New Richland *[1 d]	74	12	43.2		
New Ulm†	75	10	45.4	T.	T.
Park Rapids†	72	4	38.2	0.21	2.1
Pine River *[1]	68	9	40.0	0.18	1.0
Pleasant Mounds†	75	10	45.6	0.18	T.
Pokegama Falls[1]	71°	8	34.4	0.18	2.2
Redwing†				0.18	
Reeds Landing				0.35	
Rolling Green†	72	14	43.5	0.60	T.
Roseau	74	5	37.4	0.88	6.9
St. Charles†	67	11	41.4	0.73	T.
St. Cloud	68	10	40.4	T.	T.
St. Olaf	76	11	41.4	0.12	1.0
St. Paul					0.6
St. Peter†	80	10	43.1	0.18	
St. Vincent					3.8
Sandy Lake Dam[1]	66°	9	38.6	0.03	1.1
Sauk Center	72	8	41.6	T.	T.
Shakopee[5]	68°	12	43.4	0.10	T.
Sunrise City *[6]	68	4	40.1		
Tower†	65	15	39.2	0.90	
Two Harbors†	70	16	42.2	0.50	3.5
Wabasha *[1]	73	14	42.1	0.40	1.0
Willmar†	74	5	40.8	T.	T.
Winona	68	14	43.2	0.51	T.
Worthington	72	13	44.6	0.67	T.
Zumbrota *[1 f]	68	13	41.3		
Mississippi.					
Aberdeen†	87	30	59.6	2.00	
Agricultural College	88	40	61.0	2.72	
Batesville†	85	28	55.2	1.69	
Bay St. Louis	84	48	66.7	3.45	
Biloxi†	78	42	63.4	4.70	
Briers†	85	40	62.4	1.83	
Brookhaven†	96	30	62.8	1.75	
Canton†	87	37	60.8	2.62	
Columbus *a* †				2.95	
Columbus *b* †	93	32	59.6	2.64	
Corinth†	89	31	57.4	1.34	
Crystal Springs†	90			1.86	
Edwards	90	35	61.6	1.67	
Fayette†	93	33	63.0	2.38	
French Camps†	91	26	56.1	3.89	
Fulton†	84	31	57.0	2.14	
Greenville *a*	82	37	57.6	1.32	
Greenville *b* †	88	32	56.8	1.20	
Hazlehurst†	94	36	63.4	2.05	
Hernando†	85	35	58.0	0.20	
Holly Springs†	84	34	57.4	1.72	
Itta Bena†	85°	33°	57.4°	1.73	
Jackson†	91[h]	32	60.1[h]	1.91	
Kosciusko†	91	35	60.2	2.62	
Lake†	87	34	57.7	1.74	
Leaf *[1]	90	42	62.4		
Leakesville†	92	38	61.9	4.05	
Logtown†	90	41	65.9	2.16	
Louisville†	91	33	59.8	2.75	
Macon†	90	32	58.7	2.37	
Magnolia†	85			2.31	
Mayersville	89	35	61.5	1.79	
Mico	94	34	62.5	2.51	
Moss Point†	87	47	66.3	7.30	
Natchez†	90	40	63.8	2.71	
Okolona†	88	33	58.4	2.02	
Pontotoc†	88	34	59.7	0.50	
Port Gibson†	92	30	60.0	1.47	
Rosedale	87	29	56.0	0.97	
Stonington *[5]	90	40	63.1		
Thornton†	88	40	61.8	2.00	
Topton *[5]	90	44	64.0	1.55	
Mississippi—Cont'd.					
Vaiden	98	28	61.8	2.53	
Water Valley *† [1]	90	32	57.6	2.19	
Waynesboro *a* †	86	35	59.3	2.05	
Waynesboro *b* †	94	34	63.0	1.78	
Willamsburg	92°	31°	61.1°	2.34	
Woodville†	90	40	64.4	2.10	
Yazoo City†	88	32	59.2	2.72	
Missouri.					
Akron				0.13	
Appleton City†	78[l]	22[l]	53.0[l]	0.32	
Arthur *† [3]		23	47.0	0.50	
Bagnell†				0.00	
Bethany	81	17	49.8	0.12	
Birch Tree	79	21	50.6	0.81	
Bluffton	76	21	50.5	0.27	
Boonville†				0.04	
Brunswick	77	18	52.8	0.05	
Carrollton†	77	26	52.6	0.60	
Conception	78	27	51.8	0.05	
Cowgill *[5]	82	24	54.0	0.28	
Darksville	77	20	52.4	0.40	
Downing				0.20	
East Lynne *[2]		22	45.4	0.22	
Edgehill *[5]	76	20	51.6	0.75	
Eight Mile *[1]	76	23	50.6	0.17	
Eldon *[1]	86	26	53.6	0.13	
Elmira	86	16	50.1	0.30	T.
Emma *[3]		26	54.4	T.	
Fairport				0.20	
Farmersville				T.	
Fayette	85	23	53.6	0.08	
Fulton				0.38	
Gallatin *[1]	76	22	51.2	0.31	T.
Glasgow	82	22	51.4	0.14	
Gordonville *[3]		24	47.6	0.73	
Gorin *[1]	83	23	47.2	0.32	
Grove Dale	84	14	50.1	0.52	
Half Way	78	18	51.0	0.16	T.
Harrisonville†	81	21	51.6	0.18	
Hastain	78	17	52.3	T.	
Hermann†				0.32	
Houston	80	20	51.2	0.88	
Houstonia (near)				0.13	
Humansville	79	18	52.0	1.10	
Ironton *† [1]	75	20	48.4	0.85	
Jefferson City†	78	25	54.9	0.35	
Kansas City					T.
Kidder	79	18	50.2	0.36	
Lamar	76	27	52.8	0.85	
Lamonte				0.23	
Lebanon	82	23	54.3	0.20	
Lexington†	81	23	53.1	0.19	
Liberty	83	25	52.8	0.26	T.
Louisiana Bridge†				0.74	
McCune *† [1]	79	19	48.3	0.28	
Marble Hill	80°	19°	51.4°	0.30	
Marceline	76	21	49.6	0.35	
Marshall†	82	20	51.0	0.05	
Maryville *[6]	76	16	47.9	0.10	
Mexico†	78	21	50.8	0.15	
Miami				0.35	
Mine La Motte†	75	20	50.2	0.64	
Mineral Springs	83	26	54.4	1.56	
Mount Vernon	76	17	50.2	0.07	
Neosho	81	20	53.4	0.41	
Nevada				0.33	
New Haven *[1]	76	29	53.0	0.14	
New Madrid	80	29	56.5	1.55	
New Palestine				0.19	
Oakfield†	75	25	52.0	0.31	
Oak Ridge *[4]		27	50.2	0.25	
Oregon *a*	81	21	53.0	0.24	
Oregon *b*	80	19	50.5	0.20	T.
Osceola†				0.25	
Oto				0.40	
Palmyra *[5]	76	24	51.6	0.33	
Phillipsburg *† [1]	79	25	50.3	0.29	
Pickering *[2]	82	18	48.0	0.11	T.
Platte River *[6]	76	22	49.1	0.35	
Poplar Bluff	84	21	54.9	0.37	
Potosi	76	16	46.9	0.98	
Princeton *[1]	78	20	50.7	T.	
St. Charles	83	22	55.0	0.41	
St. Joseph†				0.26	
St. Louis	78	20	48.8	0.31	
Sarcoxie *[3]	80	25	48.2	0.55	
Shelbina				0.20	
Sikeston	86	24	55.8	0.42	
Steffenville				0.53	
Stellada†	85	20	53.5	0.20	T.
Sublett	76	16	48.0	0.04	
Tindall				0.00	
Trenton	75	22	51.0	0.16	
Unionville†	81	15	44.3	0.10	
Vermont *† [1]	78[f]	18[f]	49.8[f]	0.00	
Villas				T.	

TABLE II.—*Meteorological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Missouri—Cont'd.	°	°	°	*Ins.*	*Ins.*
Virgil City	.....	.....	.....	0.39	T.
Warrensburg *1	79	26	53.2	T.	
Warrenton	76	25	50.8	0.33	
Wheatland	.....	.....	.....	0.58	T.
Willow Springs	80	23	55.8	0.96	
Zeltonia *1	79	29	48.1	0.97	
Montana.					
Big Timber	77	18	49.7	0.38	
Billings †	80	22	52.2	2.30	5.0
Boulder †	70	18	43.4	0.46	
Bozeman †	68	22	43.7	0.44	
Butte †	74	20	45.7	0.17	1.0
Choteau †	85	17	50.4	0.30	3.0
Cokedale †	70	20	45.7	0.39	4.0
Columbia Falls †	72	16	42.8	0.26	
Dillon	75	9	43.9	T.	T.
Fort Benton †	79	13	46.5	0.04	
Fort Custer †	80	21	49.3	0.85	
Fort Keogh †	84	12	45.0	0.80	
Fort Logan †	72	9	41.4	0.55	
Fort Missoula	73	13	43.6	0.16	
Glasgow †	80	7	43.4	0.30	
Glendive	82	7	45.9	0.22	
Grantsdale ‡	74	10	39.7	0.02	
Great Falls †	90	24	55.4	0.10	
Helena	.....	.....	.....	.....	0.6
Hogan †	78	21	49.0	0.64	4.0
Kipp	81	6	42.4	1.70	1.5
Libby †	80	14	48.0	0.39	
Livingston	75	20	49.4	0.43	T.
Manhattan †	73	11	41.8	0.14	
Martinsdale †	75	16	45.4	T.	T.
Marysville †	70	25	46.0	0.63	4.1
Poplar	78	0	39.6	.....	
Sun River *	77	16	45.9	T.	T.
Toston	77	15	46.2	T.	
Troy †	76[d]	18[e]	46.0[e]	0.59	
Utica †	78	17	46.2	0.00	
Virginia City †	69	21	44.7	0.19	T.
White Sulphur Springs †	73	13	44.2	0.15	1.0
Wibaux †	90	0	47.1	0.15	
Yale †	77	11	44.4	T.	
Nebraska.					
Agee *1	81	4	46.7	0.10	.....
Alliance	.....	.....	.....	0.25	
Ansley †	78	7	46.4	0.45	3.0
Arapaho	.....	.....	.....	0.25	
Arborville *1	80	12	48.6	0.23	
Ashland *a* †	81	10	50.0	T.	T.
Ashland *b* *1	80	15	50.4	0.07	
Ashton	77	10	49.0	0.32	2.5
Auburn *† 1	82	16	51.5	0.23	
Aurora *1	78	15	48.1	0.22	T.
Bassett	83	2	46.5	T.	
Beatrice †	78	15	48.8	0.00	
Beaver City	80	14	49.7	0.91	7.0
Benkelman *1	82	16	51.6	0.00	
Blue Hill *1	78	15	50.2	0.56	1.5
Bratton *1	88[e]	17	49.5	0.25	
Brokenbow *1	80	10	49.0	0.00	
Burchard *1	75	20	54.2	0.20	
Burwell *1	76	10	44.4	0.60	
Callaway †	72	20	46.2	0.05	1.0
Central City *§	72	17	53.2	0.21	
Chester *1	76	12	49.0	0.55	T.
Columbus †	76	13	48.6	0.07	
Cornlea	.....	.....	.....	0.10	T.
Creighton	75	3	45.4	0.10	1.0
Crete	78	15	50.4	0.18	
Culbertson	.....	.....	.....	0.15	2.0
Curtis *a* †	80	12	48.1	0.25	3.0
Curtis *b* *1	80	10	45.8	0.15	1.5
David City *† 1	76	14	47.4	T.	
Divide	.....	.....	.....	0.35	3.0
Dunning *1	79	25	51.5	0.00	
Edgar *1	85	14	51.1	0.65	3.0
Ericson *† 1	81	15	47.5	0.40	3.0
Ewing †	.....	.....	.....	0.05	0.5
Fairbury	89	17	53.6	0.31	
Fairmont *1	76	15	49.7	0.28	T.
Fort Robinson	83	11	49.0	0.28	T.
Franklin †	81	16	50.1	1.20	2.0
Geneva †	82	13	49.2	T.	T.
Genoa †	75	13	48.3	0.16	
Gering †	81	12	46.5	0.16	
Gibbon	76	12	49.4	0.45	2.0
Gothenburg	80	20	53.7	0.24	3.0
Grand Island *a* *1	82	15	52.1	0.41	0.2
Grand Island *b*	79	12	49.0	0.35	1.0
Greeley	.....	.....	.....	0.10	1.0
Haigler *1	83	19	50.2	0.00	
Hartington †	77	6	44.8	0.06	
Harvard *1	76	11	47.8	0.39	0.2
Hastings *1	72	10	45.7	0.34	1.0
Hay Springs †	80	9	45.8	0.14	T.
Hebron †	79	16	49.9	0.32	T.
Hickman *1	86	22	52.2	T.	
Holdredge *b* *1	91	12	53.4	0.46	3.0
Imperial *a* †	83	9	49.2	T.	
Indianola *§	90	15	50.2	0.50	5.0
Kearney *1	78	16	48.7	0.25	1.0
Kennedy †	87	6	46.1	0.00	
Kimball †	79	10	46.6	0.50	
Lincoln	78	15	50.4	0.05	T.
Loup *a* *1	86	10	52.0	0.34	
Lynch *† 1	82	1	45.2	0.02	0.2
Lyons	.....	.....	.....	0.00	
McCook *1	83	16	53.4	0.30	3.0
Madison *1	78	5	45.0	0.06	T.
Madrid *† §	85	10	49.4	0.09	
Marquette *	77	13	.....	T.	
Mason City	.....	.....	.....	0.50	6.0
Minden *1	76	12	47.5	0.48	1.2
Nebraska City *b* *1	80	16	49.4	.....	
Nemaha City *1	74	16	47.8	0.20	
Nesbit †	84	15	53.5	0.13	
Norfolk †	75	10	47.1	0.04	
North Loup †	78	8	46.8	0.40	4.0
Oakdale †	76	7	46.2	0.05	0.3
Odell *§	74	16	51.3	0.27	
Omaha *1	72[d]	14	47.2[e]	0.06	
Omaha (W. B.)	.....	.....	.....	.....	T.
O'Neill *1	82	7	46.0	T.	T.
Ord	75	14	49.4	0.56	
Osceola	.....	.....	.....	0.27	
Ough †	.....	.....	.....	0.00	
Palmer *a* *1	74	10	44.4	0.10	
Palmer *b*	.....	.....	.....	0.22	
Plattsmouth *a* †	.....	.....	.....	0.12	T.
Plattsmouth *b* *1	80	22	51.8	.....	
Potter *1	80	9	46.0	T.	
Ravenna *a*	77	10	48.2	0.40	2.5
Ravenna *b*	.....	.....	.....	0.30	4.0
Red Cloud *a*	.....	.....	.....	0.78	2.5
Red Cloud *b* *1	78	18	49.6	0.74	3.0
Republican	80	18	46.4	0.30	2.0
Rulo *1	83	21	52.0	0.00	
St. Paul	76	13	49.2	0.30	1.0
Salem *1	82	18	50.1	0.24	
Santee Agency †	80	6	47.9	0.11	0.5
Schuyler	.....	.....	.....	0.05	
Seneca *1	80	20	47.7	0.00	
Seward *§	80	17	50.8	0.15	T.
Spencer	.....	.....	.....	T.	
Springfield *1	80	44	49.7	0.09	T.
Springview	85	1	45.1	0.00	
Stanton *1	75	11	47.0	T.	
State Farm	81	11	49.6	0.06	
Strang *1	85	18	53.7	0.40	0.5
Stromsburg	.....	.....	.....	T.	
Superior *§	76	18	49.8	0.64	T.
Sutton	76	12	47.4	0.47	1.0
Syracuse	.....	.....	.....	0.06	
Tecumseh *a* †	82	14	49.7	0.24	
Tecumseh *b* †	.....	.....	.....	0.20	
Tekamah	79	13	47.9	0.00	
Thedford *1	84	5	44.8	T.	
Turlington †	82	8	48.7	0.14	
Wakefield	.....	.....	.....	0.07	
Weeping Water *1	78	8	45.9	0.11	T.
Weston *§	82	20	55.8	0.00	
Whitman	.....	.....	.....	0.00	
Wilber *1	82	18	51.2	0.22	
Wilcox	.....	.....	.....	0.77	2.0
Wilsonville *1	80	10	48.0	0.38	5.0
Woodlawn	.....	.....	.....	0.12	
York *1	77	17	49.4	0.00	
Nevada.					
Austin	73	29	48.0	0.51	
Battle Mountain *1	82	20	49.2	0.00	
Belmont	75	20	49.7	0.66	
Beowawe *1	81	20	50.3	0.00	
Candelaria	91	34	57.9	0.30	
Carlin *1	91	— 5	49.4	T.	
Carson City	82	18	49.7	0.71	
Clover Valley †	.....	.....	.....	0.05	
Cortez †	.....	.....	.....	0.34	
Cranes Ranch	.....	.....	.....	T.	
Currant	.....	.....	.....	0.26	
Darrough Ranch	.....	.....	.....	0.63	
Downeyville	92	32	58.9	0.46	
Elko *§	88	12	45.6	0.00	
Elko (near)	80	3	43.6	T.	
Ely	78	14	44.2	0.80	
Empire Ranch †	80	20	45.6	0.19	
Fenelon *1	79	22	44.6	T.	
Genoa	74	30	51.6	0.00	
Golconda *1	80	24	50.0	0.00	
Halleck *1	78	9	38.4	T.	
Hamilton	93	15	50.9	0.73	T.
Hawthorne *a* *	81	44	54.0	0.00	
Hawthorne *b*	82	30	53.2	0.21	
Hot Springs *1	85	22	55.8	0.00	
Humboldt *1	82	19	49.6	T.	
Las Vegas	85	39	59.2	0.39	
Lewers Ranch	79	28	53.8	0.26	
Lovelock *1	88	24	55.2	T.	
Mill City *1	87	20	50.5	.....	
Osceola †	81	30	49.8	0.91	4.0
Palisade *1	87	15	46.3	0.00	
Palmetto	81	19	49.0	0.80	
Reno *§	80	28	53.3	0.10	
Ruby Valley †	.....	.....	.....	0.13	
St. Clair	82	26	52.3	0.52	
St. Thomas	100	33	67.7	T.	
San Antonio	81	20	51.8	0.61	
Silver Peak	85	23	55.3	0.37	
Stofiel	80	4	44.8	0.12	
Sunnyside	80	20	49.4	1.33	
Tecoma *1	82	32	51.5	T.	
Toano *1	80	20	44.8	0.15	
Tuscarora	76	42	58.2	0.03	
Tybo	79	25	48.6	1.02	
Verdi *1	78	27	48.0	0.00	
Wadsworth *1	86	24	52.4	0.05	
Wells	79	6	43.8	0.03	
Yerington	81	20	49.6	0.00	
New Hampshire.					
Alstead *§	63	22	42.2	2.39	1.0
Belmont	.....	.....	.....	2.87	.....
Berlin Mills	66	11	40.6	1.71	2.5
Bethlehem	62	16	39.9	1.36	2.0
Brookline *1	70	22	45.8	6.03	
Concord	68	18	44.6	4.05	
Dublin	64	21	42.4	5.70	T.
Durham	72	18	45.6	4.47	
Grafton	68	12	41.4	2.85	1.0
Hanover	62	18	43.0	1.42	0.1
Keene	67	16	42.2	3.05	
Lakeport	.....	.....	.....	3.80	.....
Mine Falls	.....	.....	.....	6.68	
Nashua	70	18	44.8	6.50	
Newton	68	17	44.1	7.45	
North Conway	74	17	42.8	1.90	
Pennichuck Station	.....	.....	.....	5.80	
Peterboro	66	15	41.8	6.52	T
Plymouth	66	12	40.1	2.00	T.
Sanbornton †	65	19	41.5	4.13	1.0
Stratford	75	14	43.8	2.09	6.0
Warner	.....	.....	.....	4.21	1.0
Weirs Bridge	.....	.....	.....	3.32	.....
West Milan	69	9	40.3	1.43	1.3
Wolfboro	.....	.....	.....	2.05	.....
New Jersey.					
Allaire	71	30	48.9	.....	
Asbury Park	69	30	50.8	3.98	
Barnegat	76	30	52.5	1.62	
Bayonne	80	28	51.6	4.54	
Beachhaven	71	35	53.2	2.02	
Belvidere	75	23	47.6	5.01	
Beverly †	79	27	51.0	3.71	
Billingsport	70	33	50.9	3.86	
Blairstown	80	29	50.8	3.91	
Boonton	75	24	48.0	2.80	T.
Bridgeton	75	33	53.0	3.38	
Camden	72	29	50.6	3.34	
Cape May	78	33	54.6	2.41	
Cape May C. H. †	72	30	53.2	2.34	
Charlotteburg	73	18	45.2	4.08	T.
Chester	75	32	46.2	5.58	T.
Deckertown	73	21	47.9	3.95	
Dover	74	21	46.5	4.16	
Egg Harbor City	75	35	49.2	2.63	
Elizabeth †	73	27	49.4	4.49	
Englewood	73	23	49.2	4.65	
Franklin Furnace	66	24	45.8	4.30	
Freehold	72	24	49.4	1.39	
Friesburg	.....	.....	.....	3.05	
Gillette	76	20	46.3	3.31	
Hammonton	.....	.....	.....	2.27	
Hanover	77	24	47.5	3.72	
Hightstown	74	28	50.1	4.02	
Imlaystown	73	29	51.0	2.33	
Junction	.....	.....	.....	4.27	T.
Lambertville	73	27	49.0	4.81	
Millville	79	28	52.4	2.32	
Moorestown	79	27	52.0	4.27	
Newark *a*	71	30	49.6	4.21	
Newark *b*	73	30	50.0	4.64	
New Brunswick *a*	79	26	51.0	3.90	
New Brunswick *b*	72	28	49.4	3.69	
Newton	70	25	47.2	4.39	
Ocean City	72	30	52.4	1.82	
Oceanic	76	35	52.6	3.52	
Paterson	75	28	50.9	5.21	
Perth Amboy	73	30	50.8	4.08	
Plainfield	79	26	50.6	4.72	
Rancocas *	70	31	.....	3.98	T.

TABLE II.—*Meteorological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
New Jersey—Cont'd.	°	°	°	*Ins.*	*Ins.*
Readington *[1]	76	30	53.1	.....	
River Vale	74	21	46.7	5.08	
Somerville	83	21	50.0	3.89	T.
South Orange	70	28	48.2	3.61	
Toms River	73	22	49.3	2.50	
Trenton	75	31	52.7	3.43	
Vineland	76	22	49.8	2.15	
Whiting	76	26	51.6	2.73	
Woodbine	75	26	50.1	2.79	
New Mexico.					
Albert†	79	31	54.3	1.19	
Albuquerque†	71	32	54.3	0.74	
Alma†	77	26	54.8	1.99	
Aztec†	78	31	52.8	0.51	
Bernalillo†	78	31	53.6	1.05	
Chama	80	15	49.8	1.37	1.5
Deming *[2]	82	52	67.7	0.15	
Downs Ranch	81	33	56.3	1.96	T.
East Las Vegas†	72	25	49.0	1.12	0.5
Eddy†	84	44	64.2	1.80	
Engle†	78	25	55.0	0.21	
Espanola†	77	23	51.9	1.39	
Fort Bayard	82	26	55.5	0.40	
Fort Stanton†	75	25	49.0	0.78	3.0
Fort Union	75	20	48.9	1.17	T.
Fort Wingate	78	20	47.2	1.80	T.
Galisteo†	81	27	54.2	1.48	
Gallinas Spring†	75	28	52.3	1.00	
Gila	83	34	59.6	0.57	
Hillsboro	79	25	54.0	0.29	
Las Cruces	82	26	56.1	1.20	
Lordsburg *[3]	78	45	62.8	.....	
Los Lunas†	76	24	52.8	1.60	
Lower Penasco†	76	25	50.5	1.98	3.0
Monero†	75	13	44.2	0.94	
Ocate†	77	17	45.2	0.96	0.5
Pecos	.....	.....	.....	1.68	
Puerto de Luna†	77	35	55.8	0.67	
Raton†	80	23	50.2	0.09	
Rincon†	81	26	56.8	0.58	
Roswell	84	32	56.9	2.11	
San Marcial†	75	35	54.8	0.82	
Santa Fe	.....	.....	.....	.....	0.5
Taos†	82	17	51.9	1.31	2.0
New York.					
Addison	69	21	45.1	0.80	T.
Akron	.....	.....	.....	1.74	
Albany	.....	.....	.....	.....	T.
Alfred [b]	66	18	41.7	1.13	2.9
Angelica†	68	20	41.8	1.32	4.5
Appleton	70	26	45.0	1.56	2.3
Arcade	67	20	40.9	2.26	13.0
Arkwright	66	26	43.4	.....	
Atlanta	.....	.....	.....	1.18	
Avon	71[d]	22	43.4	0.46	0.3
Baldwinsville	68	26	44.7	1.35	T.
Bedford	70	21	47.3	4.10	T.
Big Sandy *[20]	73	24	45.2	.....	
Binghamton†	69	20	44.1	0.82	T.
Bloomville	67	11	38.4	2.54	T.
Bolivar	.....	.....	.....	1.67	
Boyds Corners	.....	.....	.....	3.55	
Brentwood *	71	19	45.5	.....	
Brookfield	74	26	46.4	0.66	2.5
Brooklyn	74	33	52.0	4.16	
Buffalo	.....	.....	.....	.....	5.6
Canton	67	14	40.8	0.53	1.0
Carmel	69	22	45.8	3.60	T.
Charlotte *[10]	67	26	43.9	.....	
Cherry Creek	.....	.....	.....	2.95	
Cooperstown†	65	25	42.0	2.17	2.0
Cortland	67	23	42.7	0.85	
De Kalb Junction	.....	.....	.....	0.82	
Demster	.....	.....	.....	2.45	
Deposit	.....	.....	.....	1.17	
Eagle Mills	.....	.....	.....	2.42	
Elmira †	73	25	46.8	0.78	T.
Fleming	71	25	45.9	1.08	2.0
Fort Niagara †	72	26	46.1	1.41	
Friendship	69	18	41.8	1.44	5.5
Fulton	.....	.....	.....	2.86	
Glens Falls	66	20	43.0	1.17	1.5
Gloversville	68	19	41.6	1.73	5.2
Hamilton	65	19	39.5	1.58	0.1
Haskinville	.....	.....	.....	1.56	
Honeymead Brook	67	23	44.6	4.88	T.
Humphrey	72	22	42.4	2.22	11.0
Ithaca	69	22	45.2	0.99	1.5
Kings Station	.....	.....	.....	1.46	
Lebanon Springs	65	20	42.2	3.40	0.5
Le Roy	68	23	42.4	2.04	5.2
Lowville	65	18	40.9	1.54	9.0
Lyons	70	28	45.5	0.95	T.
Madison Barracks †	69	21	45.4	1.77	4.0
Malone	67	18	40.6	0.62	1.3
Manhattan Beach †	62	38	45.0	1.43	
New York—Cont'd.					
Massena	70	18	39.6	0.15	
Middletown	70	27	45.0	6.11	T.
Mount Morris	71	22	43.3	0.84	0.5
Newark Valley	.....	.....	.....	1.14	
New Lisbon	67	18	40.2	1.45	1.8
North Hammond †	70	18	43.6	0.76	1.0
Number Four †	63	18	39.1	2.46	10.5
Ogdensburg	69	22	44.4	0.93	0.2
Oneonta	69	25	45.3	1.06	
Oswego	.....	.....	.....	.....	10.3
Oxford	66	19	41.9	1.06	T.
Palermo †	68	19	42.8	2.59	13.8
Perry City	67	17	41.2	0.91	T.
Phœnix	.....	.....	.....	1.11	
Pine City	.....	.....	.....	0.38	
Pittsford	72	26	44.7	1.14	T.
Plattsburg Barracks	70	19	42.9	0.45	T.
Port Jervis	69	20	44.8	5.79	
Potsdam	70	19	43.8	0.73	T.
Poughkeepsie	70	20	46.2	4.42	
Remsen	65	18	40.8	2.43	4.0
Rochester	.....	.....	.....	.....	1.5
Rome	68	24	43.0	2.01	
Romulus	71	23	45.8	1.15	T.
Rose †	.....	.....	.....	1.35	
Saranac Lake	67	15	39.2	1.68	4.0
Scottsville	.....	.....	.....	1.26	
Setauket †	67	32	50.9	3.37	
Sherwood	.....	.....	.....	1.47	
Skaneateles	.....	.....	.....	0.82	
South Canisteo	70	17	43.1	1.17	1.1
Southeast Reservoir	.....	.....	.....	3.74	
South Kortright †	65	18	40.4	2.71	
Turin	62	20	39.5	3.71	27.1
Tyrone	.....	.....	.....	1.21	
Varysburg	72	15	42.6	2.13	9.2
Wappingers Falls	76	24	46.4	5.02	T.
Warwick	.....	.....	.....	4.30	
Waverly	74	16	44.0	0.85	0.1
Wedgwood	70	21	44.0	1.02	1.2
West Point †	72	26	47.2	4.22	T.
Willets Point	73	33	50.6	3.53	
North Carolina.					
Asheville †	78	22	51.2	0.21	
Bryson City †	.....	.....	.....	2.24	
Chapel Hill †	83	31	57.0	1.13	
Currituck Inlet †	.....	.....	.....	2.39	
Experimental Farm	80	34	57.0	2.21	
Fair Bluff †	.....	.....	.....	1.96	
Falkland *[1]	82	37	57.2	2.48	
Fayetteville †	84	36	58.4	2.50	
Flat Rock	74	24	49.1	1.77	
Goldsboro †	86	35	58.2	1.40	
Greensboro †	78	34	55.4	0.81	
Greenville	.....	.....	.....	2.43	
Henderson †	80	32	56.2	1.95	
Highlands	70	26	47.9	2.83	
Horse Cove †	76	28	52.7	2.10	
Lenoir *† [1]	74	30	52.3	1.11	
Linville †	66	18	44.3	1.21	
Littleton †	77	30	55.0	1.94	
Louisburg †	79	30	54.6	2.38	
Lumberton †	85	35	58.5	2.00	
Lynn *† [2]	80	.....	52.6	1.17	
Mocksville †	79	33	56.4	0.50	
Moncure †	83	29	55.1	1.93	
Morganton *† [1]	80	32	55.4	0.70	
Mount Airy †	77[c]	21[c]	50.8[c]	1.40	
Mount Pleasant	81	29	56.4	1.35	
Murphy †	.....	.....	.....	1.82	
Newbern †	86	33	61.1	1.53	
Oak Ridge †	79	29	54.4	1.05	
Pantego	.....	.....	.....	2.08	
Pittsboro	79	30	53.8	2.35	
Raleigh *† [1]	78	35	58.2	2.65	
Rockingham †	88	34	58.5	2.61	
Roxboro †	79	27	54.5	2.37	
Rutherfordton †	72	32	53.9	1.35	
Salem	82	28	53.0	.....	
Salisbury	82	29	55.4	1.04	
Saxon †	79	25	52.4	1.58	
Selma	87	33	57.6	2.50	
Settle	80[d]	24	55.5	1.13	
Skyuka	72	30	53.6	1.10	
Sloan †	86	33	58.5	2.71	
Soapstone Mount †	82	24	52.0	1.97	
Southern Pines † [1]	86	34[c]	61.0	1.87	
Southport †	83	39	62.8	1.91	
Tarboro	83	30	56.8	2.99	
Waynesville †	74	23	49.1	2.02	
Weldon †	78	29	53.4	0.84	
Willeyton	78	32	55.8	2.35	
North Dakota.					
Amenia	80	0	40.4	T.	T.
Ashley †	80	— 4	40.4	0.14	
Berlin	82	— 7	39.8	0.26	T.
North Dakota—Cont'd.					
Bismarck	.....	.....	.....	.....	T.
Coal Harbor	81	2	40.8	0.00	
Dickinson †	80	— 5	40.9	0.00	
Ellendale	78	0	36.4	0.27	T.
Falconer	83	.....	.....	T.	
Fargo †	80	— 3	39.8	0.14	1.0
Forman †	81	— 6	41.4	0.02	T.
Fort Berthold †	84	3	46.7	0.21	0.5
Fort Yates †	81	— 3	41.0	0.30	
Gallatin †	85	— 8	39.2	0.22	1.0
Grafton †	80	14	41.0	0.30	1.0
Jamestown †	84	— 6	42.5	T.	T.
Lakota	77	8	39.5	0.32	T.
Larimore †	83	7	41.2	0.28	2.8
Lemert *	80	— 5	39.1	0.00	
McKinney	74	— 1	39.7	0.41	
Milton †	76	7	37.9	0.20	2.0
Minto †	81[f]	11[e]	38.3[b]	0.51	
Napoleon †	80	— 2	40.6	0.25	T.
New England City †	80	7	44.1	0.00	
Oakdale †	75	4	43.9	0.05	
Portal †	74	1	40.0	0.40	T.
Power †	80	0	42.5	0.17	0.8
St. John † [1]	73	16	41.3	0.17	1.0
Sheyenne	82	— 2	40.1	0.01	0.1
Steele † [4]	83	1	40.3	0.17	T.
University †	79	9	40.4	0.65	2.5
White Earth	76	—12	39.4	0.35	
Wild Rice † [2]	.....	.....	36.7	0.20	2.0
Williston	.....	.....	.....	.....	T.
Willow City †	80	— 2	39.4	T.	T.
Woodbridge †	76	7	37.1	0.38	3.0
Ohio.					
Akron	69[f]	24[f]	45.6[f]	1.17	T.
Annapolis	78	19	47.1	0.67	T.
Ashland	67	19	44.1	1.26	T.
Ashtabula	68	29	47.9	2.97	10.0
Athens	76	16	48.4	1.46	
Atwater	.....	.....	.....	1.23	
Auburn	70	17	43.4	1.36	0.8
Bangorville	70	21	45.2	1.21	T.
Bellefontaine	74	18	45.7	2.17	
Bement * [1]	65	18	41.4	2.76	T.
Benton Ridge	79	12	47.0	0.93	T.
Bethany	76	14	47.5	0.69	T.
Big Prairie	70	18	44.8	1.05	T.
Binola	67	19	46.1	1.76	T.
Bissells	69	22	45.3	1.54	2.2
Bloomingburg	76	18	48.5	0.96	
Bloomington	.....	.....	.....	1.10	
Bowling Green	75	13	45.5	1.60	
Bucyrus	72	12	43.5	1.71	0.1
Cambridge	75	14	45.2	1.41	
Camp Dennison	78	17	50.1	0.77	
Canal Dover	72	12	45.2	1.91	T.
Canton †	71	22	46.5	1.51	T.
Cardington	70	17	45.0	0.96	T.
Carrollton	72	16	46.3	1.04	
Cedarville	72	28	52.2	0.86	
Celina	75	20	48.8	0.55	
Cherry Fork	79	12	48.1	1.15	
Circleville *a* †	.....	.....	.....	0.57	
Circleville *b*	80	19	48.8	1.26	
Clarksville	77	20	48.1	1.25	
Cleveland	65	27	46.9	2.04	2.1
Cleveland (W. B.)	.....	.....	.....	.....	0.3
Clifton	78	12	47.6	0.94	
Coalton	80	8	46.5	1.12	
Colebrook	69	22	44.5	1.54	5.0
Dayton *a*	74	18	48.8	0.90	
Dayton *b* †	.....	.....	.....	0.80	
Defiance	75	14	46.0	1.35	T.
Demos	76	20	48.1	1.73	T.
Dupont	74	12	44.8	T.	T.
Ellsworth	71	20	45.5	0.88	T.
Elyria	79	23	48.8	2.24	T.
Fairport Harbor *[10]	66	35	49.4	.....	
Fayetteville	76	19	48.7	1.09	
Findlay	75	15	44.9	1.04	T.
Fostoria	72	24	48.9	0.82	
Frankfort	75	16	47.9	1.50	
Garrettsville	75	20	43.5	1.52	T.
Granville	73	15	44.7	1.35	
Gratiot	74	17	47.7	1.33	
Greenfield	73	24	48.7	1.30	
Greenhill	78	15	44.5	1.46	T.
Greenville	69	15	45.7	0.74	
Hackney	70	19	49.9	1.41	
Hanging Rock	78	17	48.2	1.79	
Hebbardsville	84	16	52.7	1.29	
Hedges	73	7	44.0	1.00	0.2
Hillhouse	69	16	44.5	2.35	6.0
Hillsboro	83	13	48.8	1.20	
Hiram	76	25	44.4	1.41	
Hudson	72	20	44.4	0.91	
Jacksonboro	80	21	50.7	0.40	

TABLE II.—*Meteorological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Ohio—Cont'd.	°	°	°	*Ins.*	*Ins.*
Kenton †	78	16	47.3	1.16	T.
Killbuck	71	17	45.5	0.99	T.
Lancaster	73	18	46.4	1.19	
Leipsic	77	11	44.0	0.80	T.
Levering				1.25	
Logan	78	11	47.6	1.66	
Lordstown	72	22	44.6	1.07	T.
McArthur	77	15	46.5	1.52	
McConnelsville	76	18	47.9	1.73	
Marietta *a* †				0.85	
Marietta *b*	75	19	49.0	1.33	
Marion	79	15	46.5	0.93	T.
Medina	76	16	45.1	1.35	T.
Milfordton	75	17	45.1	0.99	T.
Milligan	78	12	46.6	1.69	
Millport	74	26	49.6	1.26	T.
Montpelier	70	13	43.6	0.89	T.
Napoleon	74	14	44.1	0.69	
New Alexandria	73	21	48.8	0.96	T.
New Berlin	75	18	45.0	1.28	T.
New Bremen	78	11	46.3	0.30	
New Comerstown	79	16	45.1	1.38	T.
New Holland	73	17	47.3	1.11	
New Moscow				1.55	T.
New Paris	84	21	50.7	0.71	
New Waterford				1.42	T.
North Lewisburg	75	12	45.1	1.10	
North Royalton	70	20	45.3	1.17	
Norwalk	71	12	44.8	2.05	
Oberlin	70	20	45.1	1.95	
Ohio State University	74	13	46.6	0.81	
Orangeville	69	18	43.6	1.03	1.0
Ottawa	71	13	45.3	0.69	T.
Pataskala	77	16	46.5	1.36	
Peoli	74	18	46.2	0.52	
Philo	74	22	48.8	1.45	T.
Plattsburg	78	18	47.8	0.94	
Pomeroy	81	17	48.5	0.95	
Portsmouth *a* †				1.03	
Portsmouth *b*	78	18	50.4	1.51	
Ridgeville Corners	74	13	45.5	1.25	
Ripley	75	22	49.8	1.31	
Rittman	69	16	43.4	1.31	T.
Rocky Ridge	72	19	47.1	1.58	T.
Rosewood	71	14	45.5	0.97	T.
Sandusky					T.
Sharon Center	73	30	50.3	1.08	
Shenandoah	72	15	44.3	1.46	
Sidney *b*	74	14	45.7	1.19	
Sinking Spring	76	21	47.9	1.51	
Springboro				1.62	
Steuben				2.02	
Stoutsville				1.50	
Sylvania	72	19	44.3	0.97	
Thurman	80	15	47.3	1.51	
Tiffin †	70	19	46.5	1.28	T.
Toledo					T.
Upper Sandusky	72	17	45.7	1.30	
Vanceburg	78	19	49.8	1.18	
Van Wert	75	12	45.5	0.42	T.
Vermilion	68	22	45.7	2.01	0.2
Vickery	71	21	46.0	1.78	T.
Walnut				1.43	
Warren	70	21	44.7	0.51	T.
Warsaw	76	11	43.9	0.66	T.
Wauseon	76	13	45.6	1.19	0.3
Waverly	79	15	49.5	1.31	
Waynesville	74[6]	26[6]	50.8[6]	0.85	
Wellington	72	20	48.9	1.90	
Westerville	72	15	45.9	1.08	
Wheeler †				2.66	7.0
Willoughby				1.90	1.0
Wooster *a*	73	19	44.2	1.15	T.
Youngstown	70	28	44.8	1.36	T.
Zanesville †				0.88	
Oklahoma.					
Alva †	85	25	54.9	1.40	
Anadarko	85	28	56.0	4.30	
Arapaho †	85	29	55.2	2.84	
Britton †				2.88	
Burnett †	88	28	57.0	3.87	
Clifton †	86	24	55.6	2.77	
Fort Reno †	92	32	56.2	2.53	
Fort Sill	86	32	57.1	4.59	
Guthrie †	83	31	57.5	2.30	
Hennessey	83	32	60.2	1.59	
Keokuk Falls †	84	28	54.7	3.28	
Mangum †	85	33	57.3	3.72	
Norman †	86	31	57.2	4.37	
Ponca †	84	26	54.5	0.50	
Pond Creek †	86	22	54.4	0.76	
Prudence †				0.82	
Sac and Fox Agency †	86	26	56.7	2.75	
Stillwater †	86	26	55.0	1.58	
Winnview †	83	33	55.0	1.83	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Oregon.	°	°	°	*Ins.*	*Ins.*
Albany *a* †	84	31	53.8	0.10	
Arlington †	82	26	53.9	0.00	
Ashland *b*	88	28	56.2	0.00	
Aurora *[8]	85	32	56.9	0.00	
Aurora (near)	83	29	53.2	T.	
Bandon	65	42	52.8	0.08	
Beulah	73	22	42.1	0.00	
Brownsville *[8]	86	30	54.2	0.08	
Burns	78	6	44.1	0.00	
Canyon City †	92	32	58.9	0.00	
Cascade Locks	76	34	56.0	0.20	
Comstock *[8]	86	34	52.8	0.00	
Corvallis *a*	84	27	52.6	T.	
Corvallis (near)	78	29	53.7	0.01	
Dayville †	86[1]	19	54.8[1]	0.00	
Detroit †	78	27	51.8	0.10	
Eugene †	81	29	53.0	T.	
Fife †	76	23	50.0	0.00	
Forest Grove	83	25	53.6	0.12	
Gardiner	76	40	54.1	0.07	
Glenora	83	27	53.0	0.27	
Grants Pass *a* †	84	25	55.6	0.00	
Happy Valley †	80	12	47.4	0.00	
Hood River (near)	74	24	50.6	0.01	
Hubbard	82	27	52.0	T.	
Irvington *	80	26		T.	
Jacksonville	80	30	55.0	0.00	
Joseph †	71	23	47.2	0.00	
Junction City *[8]	96	30	55.4	0.00	
Klamath Falls	84	27	55.5	0.00	
Lafayette *[8]	84	27	53.5	0.00	
Lakeview †	75	23	50.3	T.	
Langlois	76	33	55.2	0.00	
Lone Rock	80	17	49.0	0.00	
Lorella	88	22	54.6	T.	
McMinnville *a* †	82	26	53.2	0.02	
McMinnville *b* *[8]	84	34	54.5	0.04	
Merlin *[8]	84	32	52.7	0.00	
Monmouth *[8]	82	32	54.2	0.00	
Mount Angel †	86	26	54.1	0.05	
Nehalem				1.37	
Newberg	83[1]	26	56.2	0.03	
New Bridge	80	30	54.8	0.03	
Newport	81	37	53.1	0.22	
Pendleton	85	20	52.4	0.00	
Riddles *[8]	80	32	51.4	0.00	
Salem *a* *[8]	80	38	57.5	0.00	
Salem *b* †	82	30	53.6	0.00	
Salmon	78	28	52.2	0.45	
Sheridan *[8]	86	30	55.7	0.00	
Silverton *[8]	84	28	53.2	0.00	
Siskiyou *[8]	77	45	60.4	0.00	
Sparta	75	27	52.2	0.00	
Springfield *[8]	76	25	60.4	0.00	
The Dalles †	80	27	54.2	0.00	
Tillamook Rock L. H. †				0.17	
Toledo	85	31	55.5	0.00	
Vale	80	14	48.8	0.00	
West Fork *[8]	78	36	53.9	0.00	
Weston	83	21	52.6	T.	
Williams	80	28	53.7	0.00	
Pennsylvania.					
Altoona	69	26	49.1	0.55	
Aqueduct	75	25	49.6	1.27	T.
Beaver Dam †				0.52	
Bethlehem				3.69	
Brookville †				0.76	
Browers Lock				2.48	
Cameron				0.82	0.1
Carlisle	76	24	49.2	0.64	
Cassandra	65	20	44.0	1.11	T.
Cedar Run				0.80	0.1
Center Hall				1.20	
Chambersburg †	76	30	47.8	1.13	
Clarion †				0.66	T.
Coatesville	78	23	48.4	3.34	
Confluence †				0.67	
Coopersburg	70	28	48.6	4.08	
Davis Island Dam †				0.45	
Doylestown				3.17	
Drifton	69[3]	24[4]	45.4[4]	2.65	T.
Driftwood				0.57	0.5
Dubois †				0.76	T.
Duncannon				1.70	
Dyberry †	70	17	42.2	2.46	0.5
East Bloomsburg				2.06	
East Mauch Chunk	73	21	45.4	2.80	
Easton	68	27	47.0	4.62	T.
Edinboro *[1]	70	26	44.0		7.0
Ellwood Junction †				0.68	T.
Emporium	70	22	44.6	1.82	1.5
Erie					12.0
Farrandsville				1.33	
Forks of Neshaminy *[1]	71	28	49.0	2.33	
Frederick				3.17	
Freeport †				0.47	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Pennsylvania—Cont'd.	°	°	°	*Ins.*	*Ins.*
Gettysburg †	75	21	47.9	2.13	
Girardville				3.47	
Grampian	70	20	43.4	1.26	1.0
Greensboro †				0.92	
Hamburg	75	26	49.8	3.14	
Harrisburg					T.
Hollidaysburg [7]	75	19	46.0	1.10	
Honesdale	64	20	43.2	2.65	0.2
Huntingdon *a* †	78	17	48.5	1.09	
Huntingdon *b*				0.31	
Johnstown †				1.24	
Karthaus				0.10	
Keating				1.27	T
Kennett Square	77	24	49.8	3.21	
Lancaster	74	26	49.2	2.60	
Lansdale				3.27	
Lebanon	77	25	48.2	2.31	
Le Roy †	67	23	43.8	0.65	0.1
Lewisburg	74	22	47.0	1.29	
Lock Haven *a*	76	21	48.4	1.35	
Lock No. 4 †				0.67	
Lycippus	71	21	49.8	0.76	
Mahoning †				0.56	
Mifflin				1.20	
Nisbet				1.27	
Oil City †				1.24	0.3
Ottsville				4.10	
Parker †				0.75	T.
Philadelphia *a*				3.46	
Philadelphia *b*	74	34	52.8	3.16	T.
Philadelphia *c*	77	30	53.4	3.54	T.
Philadelphia, (W. B.)					T.
Point Pleasant				3.95	
Pottstown	76	26	49.2	3.64	
Quakertown	76	22	46.6	3.38	T.
Reading [5]			46.4	3.15	
Renovo				1.05	
Ridgway †				0.77	1.5
Saegerstown	73	19	44.2	1.58	2.5
Salem Corners	70	25	45.2	1.91	0.5
Saltsburg †				1.00	
Scranton	72	23	45.6	2.45	T.
Seisholtzville				3.75	
Selinsgrove	71	20	45.3	1.80	
Shinglehouse	72	19	44.2	1.06	1.0
Sinnamahoning				0.72	
Smethport	70	20	42.8	0.83	1.8
Smiths Corners				3.99	
Somerset	76	18	45.7	1.18	
South Bethlehem	78	28	51.1		
South Eaton	70	24	45.4	2.25	
Spruce Creek				1.20	
State College	69	24	47.0	1.03	
Stoyestown †				0.59	T.
Sunbury				1.06	
Swarthmore	75	26	49.3	3.15	
Towanda	70	21	45.0	1.19	T.
Uniontown	73	21	47.7	1.44	T.
Warren †				1.82	2.0
Waterville				0.73	
Wellsboro *† [1]	68	18	41.0	1.62	T.
West Chester	74	28	50.0	2.58	
West Newton †				0.72	
Westtown	72	26	48.6	3.41	
White Haven	68	21	43.4	2.67	T.
Wilkesbarre †	72	25	46.1	2.51	T.
Williamsport	71	26	47.4	1.13	
York †	73	24	48.0	2.36	T.
Rhode Island.					
Bristol	69	29	49.6	5.22	T.
Kingston	70	26	47.1	7.89	T.
Lonsdale				6.85	
Pawtucket	68	25	47.0	5.89	
Providence *a*	68	28	49.0	8.08	T.
Providence *c*	70	26	47.7	8.03	T.
South Carolina.					
Allendale †	89	33	60.9	0.09	
Anderson †				0.66	
Batesburg †	92	36	59.4	1.30	
Blackville †	90	35	60.6	2.25	
Camden †				1.68	
Central †	85	30	58.4	1.55	
Cheraw *a* †	89	32	57.6	2.07	
Cheraw *b* †				2.35	
Conway †				0.47	
Darlington *[1]	89[6]	45[6]	61.4[6]		
Edisto †				0.76	
Effingham †				1.90	
Florence †	89	38	60.6	2.04	
Georgetown †	86	39	64.7	0.20	
Gillisonville †	95	29	63.0	0.56	
Greenville †	83	32	57.6	0.03	
Greenwood †	82	28	60.8	1.14	
Holland †	89	32	59.6	0.88	
Kingstree *a* †	88	43	64.4	0.46	
Kingstree *b* †				0.47	

TABLE II.—*Meteorological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
South Carolina—Cont'd.	°	°	°	*Ins.*	*Ins.*
Little Mountain	93	38	64.1	1.30	
Longshore †	86	34	58.8	1.14	
Mount Carmel †				0.74	
Pinopolis *[1]	84	38	61.5	0.42	
Port Royal †	86	48	66.2	1.63	
Ridgeway †	86	38	59.6	1.30	
St. George †	88	40	62.0	0.18	
St. Matthews †	92	40	61.5	1.28	
St. Stephens †				0.47	
Santuck †	86	30	57.1	0.80	
Shaws Fork *[1]	90	38	63.6	0.25	
Society Hill †	86	35	58.8	2.71	
Spartanburg †	96	32	58.3	0.39	
Statesburg †	89	39	61.6	1.75	
Trenton	87	42	63.1	1.14	
Trial †	90	38	62.7	0.42	
Yemassee †	90	39	63.6	0.26	
Yorkville	82	35	59.7	1.10	
South Dakota.					
Aberdeen †	92	0	42.8	0.38	
Alexandria †	82	— 2	44.5	0.20	
Ashcroft †	85	— 2	44.8	T.	
Bowdle *† [1]	78	0	45.2	0.60	
Brookings †	77	4	44.3	0.00	
Castlewood †	76	1	41.6	0.24	T.
Cross †	81	5	44.9	0.08	T.
De Smet †				0.34	
Edgemont				0.10	
Farmingdale				0.00	
Faulkton †	80	— 4	43.8	0.16	
Flandreau †	75	4	42.6	0.40	
Forestburg †	81	— 6	44.5	0.25	
Forest City †	85	— 1	45.5	0.00	
Fort Meade	84	5	49.4	0.23	
Gary †	76	11	42.8	0.12	T.
Greenwood	82	13	49.6	0.02	0.1
Highmore † [1]	83	4	42.2	0.22	
Hotch City †	84	— 5	47.5	T.	
Howard †	79	1	43.6	0.17	
Huron					T.
Kimball †	81	7	46.4	0.06	
Leslie †	89	— 4	47.7	0.00	
Millbank *†	76	5	41.6	0.00	
Northville *[1]	76	— 4	42.0	0.50	
Nowlin †	88	— 6	44.7	0.00	
Oelrichs	84	6	47.8	T.	
Parker †	75	4	43.6	0.20	T.
Parkston † [1]	80	0	48.9	0.00	
Plankinton †	81	0	44.4	0.10	
Rochford				0.00	
Rosebud †	84	— 1	46.0	T.	
Shiloh †	85	—11	44.7	0.08	
Silver City				0.00	
Sioux Falls †	76	3	43.2	0.17	
Tyndall †	83	6	47.9	T.	T.
Vermillion	79	5	46.0	0.00	
Watertown †	79	3	40.6	0.37	T.
Webster †	82	— 1	42.6	0.21	0.2
Wentworth †	75	6	43.2	0.00	
Wessington Springs †	80	9	48.0	0.29	
Yankton	77	9	47.8	0.10	
Tennessee.					
Andersonville *[1]	92	28	50.6	2.25	
Arlington †	82	26	53.9	1.60	
Ashwood *† [1]	84	33	54.3	2.10	
Bolivar †	87	26	54.1	1.73	
Bristol	77	23	49.2	2.06	
Brownsville †	85	26	55.0	0.97	
Byrdstown †	80	26	53.5	2.88	
Carthage †				2.14	
Clarksville	83	28	53.9	1.51	
Clinton †				1.45	
Columbia †				1.95	
Covington † [2]	84	28	56.5	0.26	
Dyersburg †	80	27	52.6	1.01	
Elizabethton †	87	22	55.9	1.88	
Fairmount *[1]	75	30	54.0	1.67	T.
Florence †	80	30	54.0	1.78	
Franklin	83	24	52.2	1.97	
Greeneville †	79	27	52.8	1.83	
Harriman	89	27	57.2		
Hohenwald †				1.77	
Jacksboro				2.17	
Jackson	81	26	54.2	1.30	
Johnsonville †				1.16	
Loudon †				2.05	
Lynnville *[1]	86	35	54.8	2.84	
McKenzie *[1]	80	28	54.6	0.62	
McMinnville †	79	29	50.8	1.65	
Milan †	84	25	53.8	1.05	
Mount Carmel	80	33	56.7	1.41	
Newport *[2]	85	26	48.8	1.79	
Nunnelly *[1]	83	25	54.1	1.94	
Palmetto †				1.78	
Riddleton †	82	29	52.8	2.24	
Rockwood †				1.70	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Tennessee—Cont'd.	°	°	°	*Ins.*	*Ins.*
Rogersville *[1]	75	38	51.2	1.19	
Rugby *[1]	75	30	49.3	2.47	
Sewanee	82	34	56.6	4.30	
Springdale *† [1]	78	24	51.1	2.27	
Trenton	80	28	53.6	0.77	
Tullahoma *† [1]	79	23	51.2	2.15	
Waynesboro *[1]	79	30	53.6	2.40	
Texas.					
Albany *† [1]	75	36	56.4	3.19	
Angleton	94	42	68.8	3.25	
Arthur City †				0.76	
Aurora *[1]	98	42	63.7	2.00	
Austin *a* †	90	44	67.4	2.90	
Austin *b* *[3]	85	48	66.7	.. ....	
Ballinger †	83	36	59.1	2.13	
Beeville †	94	49	70.5	2.83	
Boerne *† [1]	86	51	66.4	1.55	
Brady †	88[f]	37[f]	59.4[f]	3.03	
Brazoria †	87	47	68.2	2.84	
Brenham †	91	48	67.2	3.56	
Burnet *† [3]	83	48	64.0	3.47	
Camp Eagle Pass †	91	38	68.0	0.21	
Chilleothe	96	35	58.4	4.55	
Coleman *[2]		44	59.8	2.97	
College Station	88[c]	44[c]	66.6[c]	3.35	
Colmesneil				3.89	
Columbia †	87	44	66.6	2.47	
Corsicana *a*	92	41	65.1	6.54	
Corsicana *b* †	86	38	61.4	4.61	
Cuero †	89	42	70.2	3.60	
Dallas †	98	37	60.8	1.35	
Deant [b]	86	32	51.8	2.50	
Devine	89	46	67.7	1.80	
Dublin †	85	40	60.6	2.47	
Durham †				1.06	
Duval *[1]	90	50	65.2	3.92	
Estelle †	90	38	62.9	2.32	
Forestburg †	88	36	60.1	0.98	
Fort Brown †	90	56	73.1	0.79	
Fort Clark	89	56	70.7	0.55	
Fort McIntosh	91	45	70.0	2.00	
Fort Ringgold †	92	45	70.6	0.00	
Fort Stockton				1.23	
Fort Worth	90[c]	41[c]	67.8[c]	2.35	
Fredericksburg *† [1]	87[d]	42	61.1	1.56	
Gainesville †	90	33	60.7	1.19	
Georgetown *[1]	86	43	62.1	3.60	
Golindo				2.95	
Goree				3.27	
Graham †	89	33	60.6	1.88	
Grape Vine †	90	40	64.6	2.05	
Hale Center †	83	39	57.4	3.40	
Hallettsville †	88	46	69.4	2.32	
Happy †	83	30	55.4	3.85	
Haskell †	77	43	60.2	2.57	
Hearne †	86	48	62.1	5.75	
Henrietta †	89	32	61.2	1.31	
Hewitt				4.20	
Houston †	96[f]	47	70.0[c]	1.92	
Huntsville †	88	46	65.4	5.41	
Kent				1.55	
Kerrville †	88	37	62.6	1.31	
Lampasas †	90	37	62.4	4.28	
Leakey †	96	38	64.8	0.50	
Llano *† [3]	87	45	64.9	2.30	
Longview †	90	42	62.2	3.59	
Lufkin †	90	41	64.6	3.32	
Luling †	89	46	67.2	1.48	
Marshall †	90	40	63.8	4.25	
Menardville *† [1]	84	40	60.5	2.75	
Midland †	94	31	61.3	0.60	
Mount Blanco *† [1]	81	34	55.5	0.33	
New Braunfels †	87	46	65.8	1.17	
Orange †	85	42	64.2	3.34	
Paris †	87	33	60.4	0.84	
Roby †	91[f]	29[f]	58.2[f]	2.07	
Rockport *[1]	86	52	71.4		
Rock Springs †	90	35	64.2	0.68	
Round Rock	78	51	65.2	3.50	
Runge †	96	48	72.0	2.10	
San Antonio	93	47	68.8	1.40	
San Marcos *a* †				2.30	
San Marcos *b* †	87	43	66.6	2.43	
Sherman	84	40	62.0	1.78	
Sierra Blanca †	80	40	60.4	1.70	
Stafford †	91	44	66.7	2.07	
Sulphur Springs †	95	36	65.9	2.06	
Temple †	84	43	63.6	5.36	
Twohig				1.10	
Tyler †	82	40	58.8	3.86	
Waco †	84	44	63.0	4.20	
Weatherford †	87	40	62.6	2.67	
Wichita Falls †	92	30	62.6	2.70	
Utah.					
Blue Creek *[3]	72	30	51.5	0.00	
Cisco †	85	24	54.0	0.99	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Utah—Cont'd.	°	°	°	*Ins.*	*Ins.*
Corinne *[2]	82	30	55.5	T.	
Deseret	79[a]	18[f]	51.2[c]	0.45	
Fillmore †	91	27	55.5	0.93	
Fort Duchesne †	78	21	47.5	0.13	
Giles †	83	23	51.5	1.04	
Grouse Creek *† [1]	80	19	43.2	0.00	
Grover †	76	19	46.2	1.38	T.
Heber †	78[c]	14[c]	46.4[c]	0.40	
Huntsville				T.	
Kelton *[3]	80	34	54.1	T.	
Koosharem	78	18	45.6	0.51	
Levan †	79	22	50.8	0.89	
Loa	77	13	43.0	1.00	T.
Logan	76	28	52.1	0.04	
Manti †	90	14	51.5	0.12	
Millville †				0.13	
Moab †	77	27	52.4	0.47	
Moroni †				0.67	1.5
Mount Pleasant *† [1]	84	28	53.8	0.52	
Ogden *a* [3]	78	32	53.4		
Ogden *b* *[1]	75	32	53.6		
Pahreah †	85	24	53.6	0.90	
Parowan †	82	21	49.3	0.58	
Promontory *[3]	87	30	57.9	0.00	
Provo City				0.20	
St. George †	95	30	57.3	0.12	
Scipio	82	13	46.9	0.83	
Soldier Summit †	75	10	41.8	0.17	
Terrace *[3]	89	20	56.6	0.00	
Thistle †	83	12	41.6	T.	
Vernal †	76	22	47.0	1.03	
Vermont.					
Brattleboro	66	20	44.8	2.25	
Burlington †	67	20	46.2	0.23	0.5
Chelsea	62	16	38.9	0.91	6.5
Cornwall	67	23	44.2	1.15	
Enosburg Falls †	63	18	40.2	0.56	2.5
Hartland †	65	15	40.7	2.46	0.5
Irasburg †	64	14	38.0	0.83	4.5
Jacksonville	63	13	39.4	5.21	4.0
Northfield					1.4
Norwich				1.46	T.
St. Johnsbury	63	15	41.5	0.51	0.2
Simonsville	63	15	37.9	2.78	T.
Strafford *† [1]	63	26	41.6	1.78	11.0
Vernon *[3]	66	20	45.0	3.99	
Wells	65	20	42.8	1.03	
Woodstock	67	14	40.3	1.46	T.
Virginia.					
Abingdon †				1.60	
Alexandria	75	30	53.8	1.56	
Ashland †	78	25	52.0	1.55	
Avon [f]	80	26	53.2	1.12	
Bedford City	78	29	52.6	1.46	
Big Stone Gap †	77	19	46.6	2.29	
Birdsnest *† [1]	78	38	57.4	4.15	
Blacksburg	74	14	46.9	1.38	
Buchanan †				0.70	
Callaville †	76	28	53.0	1.52	
Charlottesville	76	27	53.7	2.28	
Christiansburg †				1.08	
Dale Enterprise †	78	20	48.8	1.10	0.3
Fredericksburg †	78	28	53.5	2.00	
Hampton	74	34	58.2	2.63	
Hot Springs	68	14	47.0	0.55	0.5
Irwin †	76	20	50.4	2.31	
Lexington †	79	22	51.2	1.01	
Manassas	76	24	51.3	1.80	
Marion	72	19	47.8	1.79	
Monterey †	70	19	47.8	0.16	T.
Nottoway	80	27	54.6	2.23	
Petersburg †	78	30	54.6	1.80	
Richmond (near) †	87	31	56.4	2.52	
Richmond *b* †				2.54	
Rockymount †	76	28	55.4	2.29	
Salem †	83	28	56.2	0.76	
Saltville	79	18	48.4	1.97	
Smithville †	75	31[c]	54.4	2.30	
Spottsville †	75	28	52.5	1.90	
Stanardsville †	76	23	52.2	1.83	
Staunton †	76	20	51.6	1.02	
Stephens City †	77	23	51.4	1.13	
Sunbeam †	77	32	54.5	2.49	
Warsaw † [2]	75	29	51.8	1.56	
Westbrook Farm	76	30	53.6		
Wytheville	73	18	47.5	0.89	
Washington.					
Aberdeen	78	37	55.2	0.30	
Ashford				0.53	
Blaine	68	23	46.1	0.48	
Cascade Tunnel †	74	20	47.0	0.20	
Centerville	85	16	51.1	0.01	
Colfax †	77	19	49.1	T.	
Coupeville †	80[c]	34[c]	49.8[c]	0.08	
Dayton	81	22	51.3	0.00	
East Sound	65	38	50.6	0.56	

TABLE II.—*Meteorological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Washington—Cont'd.	°	°	°	*Ins.*	*Ins.*
Elbe	.....	.....	.....	0.12	
Ellensburg	80	16	48.6	0.00	
Ellensburg (near)	78	16	48.6	0.00	
Fort Simcoe	78	34	56.7	0.00	
Fort Spokane	79	12	49.5	0.03	
Grand Mound†	72	29	50.4	0.14	
Kennewick†	85	21	52.8	0.00	
Lakeside†	72	25	51.0	0.00	
Lapush	79	36	53.4	1.20	
Madrone*†[1]	68	36	50.2	0.02	
Monte Cristo†	76	36	55.4	1.70	
Moxee Valley†	80	18	50.6	0.00	
New Whatcom†	65	29	48.6	0.64	
Olga†	68	38	50.4	0.69	
Pine Hill†	78	24	52.1	T.	
Pomeroy†	84	34	59.0	0.00	
Rosalia†	75	18	49.4	0.01	
Silver Creek*[1]	70	29	49.8	0.81	
Snohomish†	74	32	51.4	0.46	
South Bend†	82	32	57.0	1.07	
Stillaguamish†	65	23	47.4	0.21	
Sunnyside†	81	21	51.8	0.00	
Tacoma†	73	33	50.9	0.14	
Union City†	72	33	51.2	0.27	
Vashon	69	26	45.8	0.02	
Waterville†	73	20	48.9	0.00	
Wenatchee Lake	78	20	49.0	.....	
West Ferndale†	71	29	49.9	0.67	
West Virginia.					
Beverly†	78	15	47.4	2.27	T.
Bloomery†	70	16	45.3	1.81	T.
Bluefield†	79	19	49.6	1.93	
Buckhannon *a*†	.....	.....	.....	1.94	
Buckhannon *b*†[4]	73	16	46.7	.....	
Charleston†	.....	.....	.....	0.72	
Dayton*[1]	75	24	50.1	.....	
Elkhorn†	73	22	49.5	2.19	T.
Ella†	73	27	50.5	1.33	
Fairmont†	.....	.....	.....	0.84	
Glenville†	74	15	47.8	0.50	
Grafton†	76	17	48.6	1.61	
Green Sulphur	81	19	46.7	0.75	
Harpers Ferry†	.....	.....	.....	0.16	
Hewett†	81	19	50.8	2.02	T.
Hinton *a*†	.....	.....	.....	1.06	
Hinton *b*†	75	21	50.0	.....	
Leachtown†	.....	.....	.....	1.40	
Marlinton	75	10	43.4	1.35	
Martinsburg†	77	23	49.2	1.38	T.
Morgantown *a*†	.....	.....	.....	0.54	
Morgantown *b*†	74	15	46.2	1.02	
New Martinsville†	78	20	47.2	1.72	
Nuttallburg†	89	8	47.8	1.45	
Pennsboro	89	15	49.5	.....	
Philippi†	.....	.....	.....	0.95	
Point Pleasant†	78	19	50.8	1.01	
Powell†on†	67	16	44.3	1.35	
Rowlesburg†	.....	.....	.....	1.15	
Sandyville†	78	13	46.0	1.25	
Spencer	79	22	51.1	1.45	
Tannery*[1]	75	18	47.8	.....	
Weston *a*†	.....	.....	.....	0.75	
Weston *b**[1]	72	18	48.2	0.75	
Wheeling *a*†	.....	.....	.....	1.05	
Wheeling *b*†	72	25	49.4	1.92	
White Sulphur Springs†	83	10	46.0	1.05	T.
Wisconsin.					
Amherst	70	10	42.3	0.50	T.
Antigo	71	4	37.9	0.61	4.3
Apollonia*†[1]	76	6	45.1	0.36	T.
Barron†‡	66	3	38.3	0.26	0.6
Belleville	76	5	41.6	0.62	T.
Beloit	71	13	44.8	0.20	T.
Black River Falls†	68	3	41.5	0.11	T.
Butternut	71	8	32.2	0.51	2.6
Centralia	73[a]	7[c]	40.2[a]	0.55	2.0
Chilton	73[a]	6[c]	39.4[a]	0.60	1.2
City Point	72	.....	.....	0.33	T.
Crandon†	72	.....	.....	0.70	7.0
Delavan†	76	9	43.4	0.40	T.
Depere†	72	14	42.8	0.58	2.8
Eau Claire	72	10	40.8	0.56	
Florence†	63	9	35.4	0.26	3.0
Fond du Lac†	69	8	41.6	0.31	0.8
Grantsburg†	80	7	44.3	0.04	0.4
Green Bay	.....	.....	.....	.....	2.7
Hartford	.....	.....	.....	0.96	T.
Harvey†	74	10	42.9	0.68	0.3
Hayward	69	3	39.0	0.26	0.6
Hillsboro	74	4	42.2	0.12	T.
Janesville†	75	11	44.0	0.19	
Kenosha*[10]	76	20	49.3	.....	
Koepenick*†[1]	66	6	37.5	1.40	4.0
La Crosse	.....	.....	.....	.....	T.
Lancaster†	71	14	41.4	0.94	
Lincoln†[2]	.....	.....	45.3	0.11	
Madison†	72	18	44.5	0.58	T.
Manitowoc†	66	17	42.0	0.53	0.5
Meadow Valley†	72	9	41.4	0.29	T.
Medford†	73	12	38.8	0.52	0.7
Milwaukee	.....	.....	.....	.....	T.
Neillsville†	68	8	40.0	0.84	T.
Oconomowoc†	74	10	45.0	0.63	0.2
Oconto	70	13	41.8	0.45	2.5
Osceola†	73	3	39.9	0.22	0.7
Oshkosh	70	20	46.8	0.44	0.6
Pepin	72	10	42.2	0.23	T.
Pine River†	74	5	42.4	0.45	1.0
Port Washington	74	16	44.6	0.60	
Prairie du Chien[8]	83	7	43.0	0.95	T.
Racine*[10]	70	19	44.7	.....	
Rhinelander	66	5	40.2	T.	T.
Royalton	75	6	41.7	0.54	2.0
Sharon†	72	17	41.9	0.72	T.
Shawano	73	7	40.7	0.34	2.0
Spooner†	70	5	40.5	0.40	4.0
Stevens Point†	72	10	41.6	0.80	2.3
Sturgeon Bay Canal*[10]	65	18	42.6	.....	
Two Rivers*[10]	62	16	44.2	.....	
Valley Junction†	71	1	41.4	0.15	0.2
Viroqua	70	12	43.2	0.60	0.2
Watertown†	72	13	43.0	0.62	0.5
Waukesha†	73	21	44.6	0.67	T.
Wausau†	68	10	39.4	0.52	2.5
West Bend	70	13	43.3	0.12	T.
Westfield†	72	7	42.7	0.40	0.5
Whitehall†	70	7	41.2	0.30	T.
Wyoming.					
Big Horn Ranch	73	10	43.1	0.57	3.0
Cheyenne	.....	.....	.....	.....	0.5
Fort Laramie†	86	11	46.2	0.62	
Fort Washakie	75	15	42.4	0.85	0.8
Fort Yellowstone†	69	14	43.4	0.44	4.2
Wyoming—Cont'd.					
Lander (V. O.)	72	14	45.4	1.09	1.5
Lander (W. B.)	.....	.....	.....	.....	1.2
Laramie	70	10	40.9	0.74	7.1
Lusk	76	9	42.8	0.00	
Sheridan	80	10	45.0	0.57	
Sundance	73	12	43.9	0.47	1.0
Wheatland	89	25	55.5	2.00	
Mexico.					
Ciudad P. Diaz	88	50	70.4	0.22	
Leon de Aldamas	83	39	63.2	1.41	
Mexico	79	39	59.0	2.43	
Puebla	78	36	61.5	2.95	
Topolobampo*[1]	95	67	80.0	10.00	
New Brunswick.					
St. John	61	26	43.5	3.19	1.0
West Indies.					
Grand Turk Island	.....	.....	.....	0.92	

EXPLANATION OF SIGNS.

* Extremes of temperature from observed readings of dry thermometer.

† Weather Bureau instruments.

‡ Record furnished by the Arrowhead Reservoir Company, in the San Bernardino Mountains, San Bernardino County, Cal., at elevations varying from 4,900 to 6,900 feet.

A numeral following the name of a station indicates the hours of observation from which the mean temperature was obtained, thus:

[1] Mean of 7 a. m. + 2 p. m. + 9 p. m. + 4.
[2] Mean of 8 a. m. + 8 p. m. ÷ 2.
[3] Mean of 7 a. m. + 7 p. m. ÷ 2.
[4] Mean of 6 a. m. + 6 p. m. ÷ 2.
[5] Mean of 7 a. m. + 2 p. m. ÷ 2.
[6] Mean of readings at various hours reduced to true daily mean by special tables.
[7] Mean from hourly readings of thermograph.
[8] Mean of 7 a. m. + 2 p. m. + 9 p. m. ÷ 3.
[9] Mean of sunrise and noon.
[10] Mean of sunrise, noon, sunset, and midnight.

The absence of a numeral indicates that the mean temperature has been obtained from daily readings of the maximum and minimum thermometers.

An italic letter following the name of a station, as "Livingston *a*," "Livingston *b*," indicates that two or more observers, as the case may be, are reporting from the same station. A small roman letter following the name of a station, or in figure columns, indicates the number of days missing from the record; for instance, "[a]" denotes 14 days missing.

No note is made of breaks in the continuity of temperature records when the same do not exceed two days. All known breaks, of whatever duration, in the precipitation record receive appropriate notice.

CORRECTIONS.

Iowa, Jefferson, August, 1895, strike out precipitation data. Louisiana, Abbeville, July, 1895, make mean temperature 80.8 instead of 89.8. Nebraska, Plattsmouth *b*, May, 1895, make mean temperature 69.0 instead of 62.0.

TABLE III.—*Data from Canadian stations for the month of October*, 1895.

Stations.	Pressure.			Temperature.		Precipitation.		Prevailing direction of wind.	Total depth of snow.
	Mean not reduced.	Mean reduced.	Departure from normal.	Mean.	Departure from normal.	Total.	Departure from normal.		
	Inches.	*Inches.*	*Inches.*	°	°	*Inches*	*Inches.*		
St. Johns, N. F	29.82	29.96	+ .02	45.6	— 0.2	9.02	.....	w.	0.0
Sydney, C. B. I	29.90	29.96	.00	46.0	0.0	5.04	+ 0.74	sw.	T.
Grindstone, G. St. L.	29.84	29.87	.....	43.4	.....	4.54	.....	nw.	0.3
Halifax, N. S	29.86	29.90	+ .01	45.9	— 0.1	5.52	+ 0.13	nw.	0.7
Grand Manan, N. B.	29.92	29.97	.....	45.8	.....	1.94	— 2.74	w.	1.3
Yarmouth, N. S.	29.91	29.99	+ .01	47.2	— 0.3	3.03	— 1.00	nw.	0.4
St. Andrews, N. B.	.....	.....	.....	43.8	.....	1.85	— 1.50	nw.	0.0
Charlottet'n, P. E. I.	29.90	29.94	.....	45.0	.....	2.74	— 1.74	nw.	T.
Chatham, N. B	29.92	29.94	— .02	40.7	+ 0.2	2.44	— 1.45	w.	0.0
Father Point, Que.	29.87	29.90	— .06	37.3	— 1.7	1.44	— 1.18	s.	1.0
Quebec, Que	29.61	29.95	— .04	37.7	— 3.3	0.93	— 2.72	sw.	1.8
Montreal, Que	29.76	29.97	— .03	40.8	— 2.7	0.72	— 2.89	s.	0.7
Rockliffe, Ont	29.40	29.92	— .10	35.4	— 3.6	1.13	— 1.57	nw.	1.0
Kingston, Ont	29.66	29.98	— .05	43.0	— 3.0	1.18	— 1.82	sw.	0.7
Toronto, Ont	29.62	30.01	— .03	41.6	— 3.9	1.04	— 1.25	w.	1.6
White River, Ont	28.52	29.91	.....	30.0	— 6.0	2.32	— 0.13	s.	11.9
Port Stanley, Ont	29.38	30.03	.00	42.9	.....	1.30	— 1.98	w.	0.2

TABLE III.—*Data from Canadian stations*—Continued.

Stations.	Pressure.			Temperature.		Precipitation.		Prevailing direction of wind.	Total depth of snow
	Mean not reduced.	Mean reduced.	Departure from normal.	Mean.	Departure from normal.	Total.	Departure from normal.		
	Inches.	*Inches.*	*Inches.*	°	°	*Inches*	*Inches.*		
Saugeen, Ont	29.25	29.98	— .02	41.6	— 3.4	1.99	— 1.82	nw.	8.6
Parry Sound, Ont.	29.25	29.96	— .05	39.0	— 3.5	1.90	— 2.42	w.	2.2
Port Arthur, Ont	29.20	29.92	— .08	34.9	— 2.6	1.20	— 1.49	w.	7.1
Winnipeg, Man	29.12	29.97	— .02	34.4	— 2.1	0.33	— 1.40	nw.	1.5
Minnedosa, Man	28.13	29.98	+ .01	33.7	+ 0.2	0.15	— 1.41	nw.	1.4
Qu'Appelle, Assin.	27.75	30.06	+ .09	33.8	— 2.7	0.25	— 0.77	nw.	0.1
Medicine Hat, Assin	27.72	30.04	+ .08	43.3	+ 1.3	0.29	— 0.15	s.	0.6
Swift Curr't, Assin.	27.45	30.07	+ .08	38.4	+ 0.4	0.04	— 1.19	nw.	T.
Calgary, Alberta	26.44	30.00	+ .04	42.2	+ 3.2	0.21	— 0.15	w.	0.2
Prince Albert, Sask.	28.46	30.01	.....	34.3	.....	0.37	.....	nw.	2.0
Edmonton, Alberta.	27.67	30.03	+ .07	41.7	+ 1.7	0.06	— 0.51	w.	0.0
Battleford, Sask	28.22	29.98	.....	36.0	.....	0.24	.....	nw.	T.
Spences Br'ge, B. C.	29.30	30.12	.....	48.6	.....	0.30	.....	e.	0.0
Hamilton, Bermuda	29.86	30.02	.00	74.4	.....	5.57	.....	s.	0.0
Banff, Alberta	25.50	30.18	.....	37.0	.....	0.17	.....	sw.	.....
Esquimalt, B. C	30.09	30.12	.....	46.8	.....	0.46	.....	s.	0.0

TABLE IV.—*Mean temperature for each hour of seventy-fifth meridian time, October, 1895.*

Stations.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	Midnight.	Mean.
Bismarck, N Dak.....	35.9	34.4	33.6	33.0	31.9	31.2	29.8	30.3	32.2	37.5	43.8	48.4	52.4	54.6	56.3	56.8	56.6	54.8	50.0	46.3	42.9	40.4	38.1	37.1	42.0
Boston, Mass.	46.5	46.2	45.8	45.5	45.0	44.8	45.2	47.2	49.3	51.5	53.2	54.7	55.4	55.8	55.3	54.2	53.1	51.9	50.6	49.5	49.2	48.5	48.1	47.4	49.8
Buffalo, N. Y *.....	45.4	45.0	44.4	44.4	43.9	43.4	43.9	45.6	47.8	49.2	50.4	51.6	52.2	52.7	53.0	52.5	51.7	50.7	49.6	48.3	47.6	47.0	46.6	46.1	48.0
Chicago, Ill.....	44.7	43.8	43.0	42.5	42.2	41.5	41.1	41.7	43.5	45.8	48.1	49.3	50.3	50.7	50.8	51.4	50.9	50.0	49.2	48.7	47.7	46.7	45.9	45.2	46.4
Cincinnati, Ohio.....	47.4	46.7	45.9	44.9	44.0	43.1	42.7	43.3	45.8	49.4	52.8	55.2	57.3	58.6	59.5	59.6	59.4	58.5	56.7	54.8	53.0	51.4	49.9	48.4	51.2
Cleveland, Ohio	45.0	44.7	44.0	43.2	42.9	42.7	42.5	43.7	45.9	48.7	50.2	51.0	51.6	52.0	52.0	52.0	51.7	50.7	49.6	48.1	47.3	46.5	45.8	45.2	47.4
Detroit, Mich.....	42.5	41.6	41.1	40.3	39.7	39.1	38.7	40.1	42.3	45.0	47.4	48.8	50.1	50.8	51.5	51.6	50.8	49.6	48.3	47.2	46.0	44.8	44.1	43.2	45.2
Dodge City, Kans.....	47.7	46.9	45.6	44.5	43.9	43.3	42.2	41.8	42.8	48.1	53.3	57.3	60.3	62.4	63.9	64.5	64.8	64.2	61.0	55.9	53.4	51.4	49.6	48.5	52.4
Eastport, Me.....	42 4	42.0	42.0	41.8	41.7	41.8	42.7	44.2	45.1	46.2	47.3	48.3	48.9	49.1	48.8	48.3	47.4	46.5	46.1	45.2	44.4	43.7	43.0	42.7	45.0
Galveston, Tex.....	69.5	69.1	68.7	68.2	67.7	67.1	66.6	65.8	65.8	66.5	67.9	69.3	70.2	71.3	71.8	72.3	72.4	72.2	71.5	70.6	70.3	70.0	69.5	69.3	69.3
Havre, Mont.....	38.9	37.4	36.4	35.3	34.1	33.4	32.3	32.8	32.7	36.0	43.8	48.9	52.3	54.9	57.5	58.9	59.5	59.1	55.8	51.1	46.2	44.4	43.1	40.9	44.4
Kansas City, Mo.....	49.4	48.8	47.7	46.8	45.9	45.2	44.2	44.0	45.2	48.3	52.4	55.3	57.7	59.7	61.5	62.5	62.5	61.8	59.6	57.0	54.8	53.6	52.0	50.4	52.8
Key West, Fla.....	77.4	77.4	77.2	77.1	77.1	77.1	77.2	78.0	78.5	79.2	79.8	80.1	80.1	80.4	80.3	80.2	79.8	78.9	78.5	78.6	78.3	78.1	77.7	77.5	78.5
Marquette, Mich.....	39.1	38.8	38.8	38.8	37.9	37.7	37.7	37.8	39.1	40.9	42.1	42.9	43.3	44.4	45.0	44.9	44.2	42.9	41.8	41.3	40.5	39.9	39.4	39.1	40.7
Memphis, Tenn.....	55.1	54.1	52.8	52.1	50.9	50.1	49.5	49.5	51.1	54.9	58.7	61.8	64.3	65.6	66.7	67.5	67.5	66.6	64.5	62.5	61.0	59.2	57.6	56.2	58.3
New Orleans, La.....	65.3	65.0	64.3	63.8	63.0	62.5	62.1	62.3	64.2	66.9	70.0	72.3	73.5	74.5	75.1	75.7	75.5	74.4	72.4	70.4	69.1	68.0	67.1	65.8	68.5
New York, N. Y.....	49.2	48.5	47.9	47.4	47.2	46.6	46.6	47.5	48.9	50.6	52.7	54.3	55.3	55.9	55.8	55.9	55.2	54.3	53.7	52.9	52.3	51.3	50.4	49.6	51.3
Philadelphia, Pa.....	49.0	48.5	47.8	47.3	46.8	46.4	46.5	48.5	50.3	52.4	54.3	56.4	57.8	58.8	59.4	59.0	57.8	56.4	54.9	53.7	52.8	51.8	50.8	49.8	52.4
Pittsburg, Pa.....	46.1	45.5	44.7	44.3	44.0	43.3	43.1	44.2	46.1	49.0	51.8	54.0	55.5	56.5	57.2	57.4	56.5	55.4	54.0	52.4	50.8	49.5	48.1	46.8	49.8
Portland, Oreg.....	54.7	53.9	52.7	52.1	50.6	49.8	49.3	49.0	47.8	47.6	48.6	50.5	53.3	56.2	59.6	61.8	64.0	64.5	63.9	62.9	60.4	58.7	57.0	55.5	55.2
Rapid City, S. Dak....	43.1	42.3	40.9	40.2	39.5	39.6	39.5	39.5	40.6	46.1	51.4	53.8	56.1	58.0	59.2	59.7	59.5	58.2	55.1	50.8	46.7	45.5	44.2	43.2	48.0
St. Louis, Mo.....	51.0	49.8	48.8	47.9	47.0	46.5	46.0	45.9	47.7	50.7	53.9	56.7	58.4	60.1	61.4	62.0	61.8	60.8	58.9	57.5	55.7	54.5	53.0	51.9	55.7
St. Paul, Minn.....	40.6	39.9	39.2	38.3	37.5	36.9	36.4	36.0	37.5	40.1	43.9	46.3	48.5	49.7	51.3	51.5	51.3	50.4	48.2	46.5	44.7	43.2	42.1	40.9	43.4
Salt Lake City, Utah..	51.9	50.9	50.2	49.4	49.2	47.8	47.0	46.9	46.7	49.1	52.9	57.4	60.7	62.9	63.6	64.4	64.7	63.9	62.4	58.9	56.1	54.4	53.2	51.8	54.8
San Diego, Cal.....	62.2	62.0	61.8	61.7	61.3	61.3	60.9	61.0	60.6	61.2	63.0	64.6	66.6	67.5	68.0	68.4	68.4	68.4	67.5	66.5	64.8	64.2	63.3	62.8	64.1
San Francisco, Cal....	55.6	55.3	54.8	54.6	54.6	54.4	53.7	53.6	53.6	53.7	55.2	57.0	58.5	60.0	62.1	63.1	63.7	62.6	61.1	59.3	57.6	57.1	56.6	56.3	57.3
Santa Fe, N. Mex.....	46.5	45.8	44.9	44.1	43.0	42.0	41.3	41.2	41.6	46.6	49.2	51.9	53.4	55.6	56.8	57.9	58.0	57.7	55.9	52.5	49.9	48.8	47.5	46.5	49.1
Savannah, Ga.....	60.9	59.9	59.4	58.7	58.2	57.6	57.9	60.2	64.5	68.3	71.2	73.2	74.3	75.3	75.2	74.3	72.3	69.4	67.3	65.9	64.7	63.8	62.9	61.7	65.7
Washington, D. C....	46.7	46.1	45.5	44.6	44.3	44.2	43.6	46.7	50.4	54.5	56.8	58.8	60.5	61.5	62.1	61.9	61.0	58.2	55.0	52.5	51.2	49.9	49.0	47.9	52.2

* Means for twenty-seven days.

TABLE V.—*Mean pressure for each hour of seventy-fifth meridian time, October, 1895.*

Stations.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	Midnight.	Mean.
Bismarck, N. Dak..	28.271	.274	.278	.277	.280	.284	.292	.290	.302	.300	.308	.295	.279	.259	.245	.239	.235	.236	.242	.248	.257	.264	.269	.272	.271
Boston, Mass	29.875	.869	.868	.873	.880	.883	.896	.904	.900	.896	.886	.871	.854	.849	.846	.849	.857	.866	.873	.877	.882	.882	.878	.875	.874
Buffalo, N. Y.....	29.265	.260	.256	.255	.260	.263	.269	.277	.279	.278	.272	.259	.250	.241	.238	.239	.245	.252	.258	.262	.265	.263	.261	.260	.259
Chicago, Ill	29.171	.171	.170	.170	.175	.180	.186	.196	.204	.206	.204	.200	.184	.167	.157	.157	.156	.157	.164	.164	.169	.169	.173	.170	.176
Cincinnati, Ohio...	29.442	.443	.441	.443	.450	.457	.466	.476	.483	.483	.478	.465	.442	.422	.410	.407	.404	.409	.418	.426	.433	.435	.437	.433	.442
Cleveland, Ohio....	29.251	.252	.250	.249	.253	.257	.260	.271	.275	.269	.264	.259	.244	.228	.226	.223	.229	.237	.248	.253	.253	.251	.248	.245	.250
Detroit, Mich.....	29.256	.256	.251	.251	.252	.257	.262	.269	.275	.276	.270	.263	.247	.238	.232	.231	.234	.239	.248	.254	.256	.263	.258	.253	.254
Dodge City, Kans..	27.523	.522	.521	.518	.516	.519	.528	.532	.544	.553	.556	.553	.544	.521	.500	.489	.482	.477	.481	.491	.501	.511	.522	.527	.518
Eastport, Me	29.873	.872	.872	.875	.878	.885	.893	.898	.897	.893	.880	.866	.856	.854	.852	.854	.862	.867	.874	.882	.891	.894	.895	.895	.877
Galveston, Tex....	30.051	.050	.047	.043	.044	.052	.064	.076	.091	.102	.103	.099	.083	.061	.042	.032	.030	.028	.036	.046	.054	.060	.062	.057	.059
Havre, Mont.....	27.432	.455	.458	.458	.457	.455	.456	.457	.460	.467	.473	.471	.467	.455	.440	.429	.425	.418	.417	.419	.424	.428	.435	.441	.447
Kansas City, Mo...	29.128	.133	.135	.134	.136	.142	.148	.154	.169	.177	.175	.173	.155	.131	.113	.101	.098	.094	.097	.104	.109	.117	.123	.125	.132
Key West, Fla.....	29.931	.921	.914	.911	.915	.925	.938	.951	.963	.968	.964	.951	.931	.916	.905	.901	.905	.914	.924	.940	.949	.955	.952	.946	.933
Marquette, Mich...	29.124	.120	.115	.115	.117	.123	.127	.135	.140	.142	.142	.146	.139	.128	.121	.122	.127	.130	.138	.136	.139	.135	.134	.129	.130
Memphis, Tenn	29.710	.706	.706	.705	.708	.713	.724	.735	.750	.757	.758	.751	.731	.708	.690	.679	.676	.677	.683	.694	.690	.705	.707	.707	.712
New Orleans, La...	30.025	.021	.017	.019	.025	.033	.042	.055	.070	.075	.071	.062	.040	.017	.002	.995	.992	.997	.005	.013	.022	.020	.029	.028	.029
New York, N. Y ...	29.703	.700	.701	.700	.704	.710	.721	.728	.736	.721	.706	.694	.677	.666	.660	.657	.664	.672	.676	.685	.693	.694	.691	.691	.693
Philadelphia, Pa...	29.935	.934	.929	.932	.939	.945	.954	.967	.968	.965	.951	.933	.912	.898	.890	.889	.892	.899	.909	.917	.924	.924	.924	.925	.927
Pittsburg, Pa	29.172	.172	.168	.172	.177	.184	.195	.204	.207	.201	.192	.179	.158	.144	.137	.135	.136	.143	.149	.157	.163	.166	.167	.166	.169
Portland, Oreg....	29.925	.929	.933	.937	.941	.942	.945	.947	.951	.956	.964	.966	.963	.958	.937	.923	.911	.905	.899	.896	.904	.912	.918	.926	.933
St. Louis, Mo	29.532	.536	.537	.537	.544	.553	.562	.574	.584	.585	.580	.571	.551	.528	.513	.505	.502	.500	.507	.512	.516	.522	.528	.528	.538
St. Paul, Minn.....	29.113	.115	.120	.121	.125	.130	.135	.140	.146	.150	.145	.142	.131	.115	.102	.095	.091	.093	.096	.101	.107	.112	.113	.114	.119
Salt Lake City, Utah	25.721	.730	.720	.726	.727	.730	.734	.738	.742	.749	.758	.756	.749	.738	.723	.713	.706	.704	.702	.706	.710	.716	.722	.725	.726
San Diego, Cal.....	29.900	.900	.898	.896	.887	.882	.883	.887	.895	.908	.920	.923	.920	.912	.895	.880	.869	.866	.863	.867	.877	.887	.898	.904	.892
San Francisco, Cal.	29.849	.850	.848	.851	.849	.845	.846	.849	.855	.867	.879	.888	.891	.887	.874	.854	.841	.833	.825	.824	.831	.840	.846	.854	.853
Santa Fe, N. Mex..	23.373	.372	.374	.371	.368	.368	.371	.376	.383	.394	.397	.398	.398	.385	.369	.355	.349	.345	.343	.346	.354	.363	.370	.375	.371
Savannah, Ga.....	29.971	.967	.963	.965	.973	.982	.996	.006	.015	.017	.011	.992	.971	.951	.944	.940	.941	.949	.957	.967	.978	.975	.973	.970	.974
Washington, D. C..	29.968	.968	.964	.966	.972	.980	.988	.000	.004	.008	.993	.969	.945	.928	.919	.914	.912	.923	.932	.941	.952	.957	.956	.957	.959

TABLE VI.—*Average wind movement for each hour of seventy-fifth meridian time, October, 1895.*

Stations.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	Midnight.	Mean.
Abilene, Tex.	5.5	5.3	4.8	5.4	2.6	5.5	5.3	6.1	6.1	7.2	8.8	9.5	9.9	9.4	9.5	9.3	9.2	9.0	7.4	5.5	5.4	5.1	5.0	5.5	6.9
Albany, N. Y.	6.3	6.3	6.2	6.0	6.2	5.6	6.7	7.7	9.5	9.9	11.5	12.0	12.2	12.2	11.7	11.3	9.9	8.3	6.8	6.9	7.1	7.0	7.0	7.0	8.4
Alpena, Mich.	8.3	8.5	8.6	8.1	8.3	8.3	8.2	8.5	9.3	11.1	12.5	12.9	13.2	12.9	13.5	14.0	13.2	11.8	10.1	10.1	10.0	9.6	9.4	9.0	10.4
Amarillo, Tex.	15.2	16.0	15.4	14.9	14.5	14.0	13.4	13.6	13.2	13.9	16.6	16.6	16.2	15.6	14.5	14.1	14.2	14.5	13.5	13.1	13.1	13.5	14.5	14.9	14.5
Atlanta, Ga.	9.1	9.7	9.7	9.7	10.2	10.0	9.6	9.6	9.2	10.4	11.2	11.2	11.4	11.1	11.5	11.3	10.9	9.4	8.2	8.7	8.9	8.6	8.7	9.1	9.9
Augusta, Ga.	3.8	4.1	5.1	4.5	4.6	4.6	4.9	4.7	5.4	7.1	7.0	7.4	8.0	8.4	7.8	8.2	7.6	5.7	4.4	3.6	3.3	3.1	3.3	3.5	5.4
Baker City, Oreg.	6.5	7.1	7.6	7.9	8.1	7.3	7.8	8.0	8.0	7.8	6.9	4.9	2.5	3.3	3.7	4.1	5.1	5.3	4.5	4.2	3.0	4.4	4.8	5.6	5.8
Baltimore, Md.	5.1	5.2	6.0	6.2	6.1	6.0	6.1	7.1	7.6	9.1	8.9	9.2	9.5	10.7	11.5	11.2	10.5	8.1	6.3	6.5	6.5	6.3	6.5	6.0	7.6
Bismarck, N. Dak.	7.3	6.7	6.9	6.8	7.1	7.7	8.9	8.2	8.3	9.6	11.1	12.9	14.8	16.7	17.0	16.6	15.7	14.2	10.9	8.9	7.9	8.3	7.4	7.5	10.3
Block Island, R. I.	16.1	15.7	15.6	15.8	15.8	15.5	15.4	15.0	16.4	15.7	14.7	15.0	15.7	15.9	16.4	16.4	15.9	15.6	16.4	17.0	17.7	17.0	16.0	16.2	16.0
Boston, Mass.	10.5	10.8	10.5	10.3	10.5	10.3	10.7	11.5	12.3	13.3	14.4	14.7	14.6	14.8	15.3	14.8	13.0	11.7	11.0	10.5	10.9	10.8	10.4	11.0	12.0
Buffalo, N. Y.	14.2	13.9	13.0	13.3	13.6	13.1	14.5	14.5	15.1	16.3	16.6	17.0	17.4	18.2	18.0	18.5	18.2	18.0	16.5	14.9	13.5	13.9	13.7	14.2	15.4
Cairo, Ill.	5.5	6.1	5.8	5.3	5.5	5.3	5.3	5.5	6.2	7.3	7.8	8.1	8.8	9.6	9.8	9.6	9.0	7.5	6.2	6.0	6.1	5.9	5.9	5.3	6.8
Cape Henry, Va.	16.2	17.1	16.5	17.1	16.9	16.3	16.6	17.1	16.5	16.2	16.3	16.0	16.4	16.2	15.0	14.5	12.8	11.8	12.2	13.2	14.0	14.9	15.9	15.8	15.5
Charleston, S. C.	8.6	8.2	8.1	8.3	8.6	8.5	8.6	9.2	9.5	10.3	10.2	10.4	10.7	11.0	10.6	10.7	9.7	8.3	7.6	7.3	7.6	7.0	7.2	7.5	8.9
Charlotte, N. C.	6.0	6.3	6.1	6.0	5.8	6.1	6.1	6.4	7.0	8.0	7.8	7.6	7.9	8.3	8.3	8.0	7.0	5.5	5.6	5.8	6.1	6.3	5.9	6.1	6.7
Chattanooga, Tenn.	4.1	4.4	4.1	4.0	4.1	4.1	4.1	4.3	4.9	6.2	7.3	7.5	8.4	8.2	8.3	8.6	9.1	7.8	5.7	4.6	4.3	3.9	3.7	4.3	5.7
Cheyenne, Wyo.	7.7	7.9	8.0	8.2	7.6	7.8	8.1	8.8	8.9	8.6	10.6	12.3	12.0	12.4	12.5	11.8	12.4	12.5	10.8	8.5	6.8	6.2	6.5	7.4	9.3
Chicago, Ill.	17.8	17.8	18.5	18.4	17.4	16.5	16.3	16.0	16.1	16.9	17.1	17.8	18.9	18.4	19.4	18.6	17.6	16.1	15.9	15.7	16.2	16.8	16.6	17.1	17.2
Cincinnati, Ohio.	5.3	5.0	4.9	5.0	5.1	4.9	4.9	5.4	7.4	8.9	10.1	9.9	10.2	10.6	10.6	10.3	10.2	9.3	7.8	7.0	6.6	5.9	5.4	5.2	7.3
Cleveland, Ohio.	14.8	14.8	14.7	14.3	14.3	13.9	14.5	14.8	15.4	15.7	17.5	18.2	18.2	18.2	17.7	18.2	17.8	15.6	14.0	14.0	14.6	14.3	13.9	14.1	15.6
Columbia, Mo.	6.2	6.3	6.7	6.1	6.2	6.5	6.8	6.5	6.9	8.6	9.5	10.4	10.5	11.5	11.8	11.8	11.3	9.3	6.6	6.1	6.6	6.3	6.7	6.6	8.0
Columbus, Ohio.	4.5	4.6	4.8	5.3	5.0	5.0	5.0	5.6	6.3	7.4	8.3	9.1	9.7	9.2	9.1	8.6	8.1	7.0	5.7	5.7	5.5	5.5	4.7	4.5	6.4
Concordia, Kans.	6.1	6.0	6.0	5.9	5.1	4.5	3.8	3.8	4.4	6.2	7.6	7.4	7.6	8.3	8.2	8.0	7.8	7.2	4.9	4.2	5.0	5.9	6.5	6.1	6.1
Corpus Christi, Tex.	10.0	10.0	9.3	9.3	8.9	9.2	9.0	8.3	9.0	10.2	10.1	10.0	9.5	10.6	11.4	12.7	12.5	12.9	12.6	12.0	11.1	10.7	10.5	10.1	10.4
Davenport, Iowa.	7.3	7.0	7.0	7.4	7.4	7.4	7.0	7.1	8.2	9.0	10.7	12.0	12.7	13.3	14.1	13.9	12.8	10.4	7.7	6.6	7.1	7.2	7.0	7.1	9.1
Denver, Colo.	6.0	6.2	6.4	6.2	5.9	6.4	6.4	6.6	6.6	6.3	5.8	6.8	6.9	7.3	7.4	7.6	7.5	8.6	8.9	8.0	6.4	6.1	5.7	6.0	6.7
Des Moines, Iowa.	6.5	6.5	6.1	6.0	6.2	5.8	5.7	6.0	6.4	7.8	9.5	10.3	10.6	10.7	11.2	11.6	11.5	9.8	7.7	6.6	6.0	6.2	6.3	6.4	7.8
Detroit, Mich.	10.3	10.8	11.4	11.0	11.5	11.5	11.9	12.0	12.6	14.7	15.4	16.0	16.5	17.3	17.0	16.4	15.5	12.4	11.0	10.7	10.3	10.7	10.8	10.6	12.8
Dodge City, Kans.	8.8	8.1	7.2	6.9	7.1	7.7	6.7	6.3	6.2	8.5	11.7	11.7	11.8	12.1	12.4	12.2	11.7	11.2	9.4	7.5	8.0	9.0	9.2	8.8	9.2
Duluth, Minn.	9.5	9.8	9.5	9.1	8.8	8.9	8.7	9.1	9.2	10.4	11.3	12.1	12.9	12.9	12.7	12.3	11.7	10.5	9.1	9.4	9.2	9.5	9.2	9.7	10.2
Eastport, Me.	10.1	9.5	9.4	10.0	10.1	10.6	10.8	11.5	13.1	14.1	13.9	14.3	13.8	14.3	14.3	13.8	12.4	10.8	10.9	11.7	11.9	11.7	11.3	11.7	11.9
El Paso, Tex.	9.2	8.6	9.0	8.8	8.9	9.0	8.9	8.8	8.3	8.4	9.9	11.1	10.9	10.6	10.3	10.3	10.5	10.4	9.9	8.5	7.4	7.4	8.3	8.5	9.2
Erie, Pa.	12.5	12.2	12.9	12.5	12.9	12.7	12.7	13.0	12.8	12.9	13.4	13.7	14.4	14.0	14.2	13.8	12.9	11.7	11.6	11.4	11.5	10.9	11.2	11.4	12.6
Eureka, Cal.	3.1	3.7	3.1	2.8	3.4	3.4	3.5	2.8	2.7	2.8	3.0	2.6	3.4	3.9	4.9	5.8	7.1	7.4	6.3	6.1	5.3	4.8	4.4	3.5	4.2
Fort Canby, Wash.	7.2	6.5	6.3	6.0	6.4	6.5	6.0	7.0	6.7	6.2	6.4	6.1	6.4	6.5	7.7	7.7	7.8	7.7	7.8	8.5	9.0	9.1	9.6	8.2	7.2
Fort Smith, Ark.	4.1	3.9	4.3	4.1	4.2	4.2	4.7	5.2	5.5	5.8	6.0	5.5	6.0	7.0	7.2	7.4	7.6	6.1	4.8	4.0	3.4	3.5	3.8	4.0	5.1
Fresno, Cal.	5.7	5.5	4.8	4.2	3.6	3.1	3.3	3.2	2.6	2.9	2.7	3.3	4.1	3 8	3.4	3.6	3.8	4.3	5.1	4.7	4.5	4.9	5.2	5.9	4.1
Galveston, Tex.	10.0	10.3	10.3	10.2	10.5	10.5	10.4	10.4	11.0	10.6	11.3	11.2	10.9	10.7	10.5	10.1	9.7	9.7	8.8	9.1	9.3	9.3	9.7	9.5	10.2
Grand Haven, Mich.	12.0	11.5	12.3	12.5	12.4	11.6	11.1	11.8	12.3	13.4	13.8	14.5	14.5	14.8	14.1	14.1	14.1	12.3	11.3	10.8	10.9	11.6	11.2	11.8	12.5
Green Bay, Wis.	8.1	8.2	8.0	8.1	8.1	8.2	8.2	8.3	8.7	10.9	12.4	13.0	13.5	13.5	13.3	13.1	12.8	11.2	9.0	8.3	8.5	8.4	8.2	8.7	9.9
Hannibal, Mo.	6.8	7.0	7.0	7.7	7.7	7.3	7.6	7.4	7.3	9.5	10.6	11.1	11.9	12.3	12.5	11.9	11.2	9.0	6.4	6.3	6.3	6.6	7.0	7.1	8.6
Harrisburg, Pa.	4.8	4.7	4.8	4.5	4.7	4.9	4.6	5.0	5.7	7.5	8.3	9.1	10.2	10.6	10.8	10.5	9.3	7.9	7.0	6.8	6.5	6.6	5.6	4.9	6.9
Hatteras, N. C.	15.1	15.5	16.2	16.3	16.1	16.4	16.1	16.3	17.0	16.6	16.5	16.2	16.5	17.1	16.2	15.7	15.2	15.0	13.8	14.0	14.0	14.2	14.6	14.8	15.6
Havre, Mont.	6.1	5.5	5.5	5.7	6.4	6.3	6.5	6.3	6.6	7.3	9.3	11.4	13.3	13.6	13.5	13.1	13.1	11.6	9.0	6.3	5.4	5.5	5.7	6.3	8.3
Helena, Mont.	8.5	6.6	6.0	5.8	5.1	5.0	5.0	4.7	4.4	4.5	3.6	4.4	4.9	4.8	5.4	6.2	6.6	6.8	6.1	6.1	8.2	9.2	9.3	8.2	6.1
Huron, S. Dak.	11.2	11.3	11.6	12.4	12.4	12.2	12.0	11.4	11.4	13.1	15.5	16.6	16.9	17.7	18.4	18.1	17.5	16.6	13.3	11.7	11.0	11.3	10.7	11.2	13.6
Idaho Falls, Idaho.	5.3	5.1	5.4	5.5	5.5	5.3	5.2	5.1	5.5	5.9	5.5	5.5	5.5	6.5	7.0	7.2	7.5	7.2	7.0	6.6	7.2	6.5	5.6	4.8	6.0
Independence, Cal.	4.5	5.4	5.7	5.4	5.9	6.2	6.5	6.1	7.1	6.7	7.3	7.4	8.8	8.0	6.9	6.9	6.7	6.1	6.5	5.8	5.9	5.6	5.6	5.3	6.3
Indianapolis, Ind.	4.3	3.8	3.9	4.2	4.3	4.0	5.0	5.2	5.7	6.9	7.5	7.8	8.2	8.1	8.2	8.2	8.4	7.0	5.3	5.4	5.1	4.8	4.7	4.5	5.9
Jacksonville, Fla.	5.5	5.4	6.0	6.0	5.7	6.0	5.9	6.3	7.9	9.6	10.2	10.3	10.4	10.5	10.5	10.6	9.9	8.3	6.6	5.8	5.8	5.8	6.1	5.5	7.5
Jupiter, Fla.	13.7	13.6	13.2	13.7	13.7	13.9	13.8	13.5	14.0	15.3	15.4	16.2	16.6	15.5	15.5	14.7	14.3	13.5	13.6	13.8	13.4	14.1	14.2	13.9	14.3
Kansas City, Mo.	7.2	7.7	7.5	7.0	6.5	6.8	6.6	6.9	7.1	8.1	9.1	9.7	10.0	-9.9	9.7	9.3	9.0	8.2	6.5	5.8	6.4	6.1	6.6	6.8	7.7
Keokuk, Iowa.	5.9	6.4	6.6	6.5	6.4	6.5	5.8	6.0	6.4	8.0	9.1	9.8	10.4	11.3	11.2	11.1	10.7	9.0	6.8	5.8	6.1	6.1	5.9	5.6	7.6
Key West, Fla.	13.5	13.5	13.7	13.4	13.3	13.4	12.1	12.6	13.1	13.1	13.3	13.1	13.0	12.7	12.6	12.6	12.7	12.3	12.1	11.9	12.3	12.0	12.2	12.7	12.8
Kittyhawk, N. C.	17.5	17.6	17.6	18.5	19.5	19.6	19.5	18.8	19.4	19.4	19.6	19.1	18.8	18.2	17.6	17.7	17.0	15.4	14.8	14.5	16.2	16.8	16.9	16.8	17.8
Knoxville, Tenn.	2.6	2.5	2.7	2.5	2.6	2.5	2.7	3.0	4.0	5.0	5.4	6.0	6.5	6.5	6.6	6.4	6.0	5.5	4.4	3.7	2.7	2.6	2.5	2.5	4.1
La Crosse, Wis.	7.2	7.2	6.7	7.0	7.3	7.0	7.0	6.9	7.2	8.8	9.1	8.5	9.5	10.2	10.6	10.3	10.8	9.5	8.0	7.9	7.2	6.7	7.1	6.5	8.1
Lander, Wyo.	1.5	1.4	1.5	1.6	1.5	1.5	1.3	1.6	1.3	0.9	1.5	2.1	2.6	3.1	3.3	3.4	3.4	3.3	2.8	3.2	3.5	2.5	1.7	1.5	2.2
Lexington, Ky.	9.6	10.2	9.6	9.5	9.5	9.6	9.7	9.4	9.3	11.0	11.9	12.7	12.9	13.5	14.6	13.3	12.4	10.9	9.5	9.8	10.1	10.3	9.6	9.6	10.8
Little Rock, Ark.	4.6	4.6	4.4	4.2	4.6	4.7	4.8	5.3	5.5	6.6	7.2	7.4	6.9	6.5	6.5	7.5	7.5	6.3	5.5	5.1	4.4	4.3	4.1	4.4	5.5
Los Angeles, Cal.	1.8	2.0	1.7	2.0	2.1	1.8	2.2	2.2	1.9	2.2	2.2	2.4	3.0	3.4	4.0	4.8	6.1	6.8	6.2	5.4	3.7	2.4	2.0	2.0	3.1
Louisville, Ky.	6.3	6.2	5.3	5.3	4.6	5.1	5.2	6.1	7.2	8.5	9.1	9.4	9.8	10.5	10.6	10.5	10.4	9.3	7.7	7.5	6.7	6.4	6.6	6.5	7.5
Lynchburg, Va.	2.6	2.3	2.0	1.9	1.8	1.7	2.2	2.3	3.0	5.0	5.9	6.3	7.0	7.3	7.2	7.2	6.4	4.6	3.5	3.6	3.1	2.9	2.5	2.7	4.0
Marquette, Mich.	11.5	12.2	12.6	13.2	13.0	11.7	12.2	11.6	12.0	12.5	13.4	13.5	13.0	13.1	13.4	13.2	11.8	11.4	10.1	10.7	11.0	11.5	11.5	11.6	12.2
Memphis, Tenn.	8.4	8.2	8.1	8.1	7.4	7.2	7.5	7.0	7.3	7.5	8.2	8.7	8.5	8.8	8.9	8.6	9.2	8.5	7.5	6.9	7.7	7.9	8.1	8.1	8.0
Meridian, Miss.	3.2	3.5	2.9	2.6	2.7	2.7	2.9	3.4	4.3	5.9	6.9	7.3	7.7	7.7	7.3	7.1	6.9	5.6	3.7	3.5	2.9	2.9	3.0	2.6	4.6
Miles City, Mont.	5.0	4.8	5.0	4.8	5.5	5.6	4.8	4.8	4.8	5.3	5.7	6.7	8.8	9.8	10.3	10.6	9.8	9.4	7.8	6.3	5.4	5.3	5.3	5.5	6.5
Milwaukee, Wis.	9.3	9.5	9.5	9.7	9.8	10.5	10.3	9.9	10.5	11.9	13.4	13.8	14.7	14.7	15.0	14.7	13.6	12.0	9.8	9.5	9.7	9.3	9.2	9.6	11.3
Mobile, Ala.	6.5	6.5	6.7	6.7	6.6	6.7	6.8	6.8	7.1	7.5	7.5	7.7	8.2	8.5	9.3	9.7	9.1	7.9	7.1	6.7	6.6	6.7	6.7	6.6	7.3
Montgomery, Ala.	4.2	4.3	4.0	4.1	4.2	3.8	4.0	4.1	5.5	6.2	7.3	7.4	7.6	8.2	8.3	8.4	8.2	6.1	4.7	4.2	4.4	4.4	4.1	4.3	5.5
Moorhead, Minn.	10.7	10.5	10.1	10.0	10.2	10.4	10.1	10.7	11.0	12.1	13.6	14.8	15.1	15.5	16.7	16.5	15.4	13.9	10.7	9.8	10.0	10.1	10.5	10.1	12.0
Nantucket, Mass.	11.8	12.0	12.9	12.7	12.3	11.7	11.2	12.1	13.1	13.0	13.4	11.9	12.8	13.7	13.6	13.3	12.2	11.4	11.0	11.9	13.0	13.2	13.6	13.3	12.5
Nashville, Tenn.	4.2	3.9	3.6	3.3	3.4	2.7	3.0	3.1	4.0	5.3	6.5	7.3	7.4	7.4	7.6	8.1	7.8	6.4	5.5	5.5	5.0	4.5	4.2	3.7	5.1
New Haven, Conn.	8.4	8.4	7.9	7.2	7.8	8.1	7.7	8.0	9.8	12.1	13.2	13.1	13.2	13.1	13.0	12.8	11.7	10.0	9.4	9.4	9.3	9.5	9.5	9.1	10.1
New Orleans, La.	7.5	7.4	7.5	7.2	7.5	7.8	7.9	7.9	8.5	8.9	8.9	8.6	9.2	9.5	10.0	9.5	9.5	8.2	6.8	6.7	6.8	7.2	7.1	7.4	8.1
New York, N. Y.	13.7	12.6	13.5	11.7	11.9	11.9	11.9	11.8	12.6	14.1	14.1	14.5	15.7	17.4	18.1	18.9	17.7	16.4	16.3	16.5	15.9	15.1	15.3	15.6	14.7
Norfolk, Va.	8.1	8.3	7.7	8.1	8.0	7.8	8.0	9.0	10.0	11.0	11.7	11.0	10.9	10.5	10.1	9.2	8.5	7.7	7.8	7.5	7.6	8.4	7.7	7.6	8.8
Northfield, Vt.	9.6	9.0	8.5	8.5	8.6	7.9	7.6	7.5	8.0	10.0	11.5	12.7	13.6	13.3	12.8	12.3	11.2	9.4	8.4	9.6	9.2	9.0	9.6	9.2	9.9
North Platte, Nebr.	6.8	6.2	5.7	6.5	6.5	6.1	6.4	6.2	5.4	6.9	9.1	10.2	11.9	13.1	13.5	14.3	13.7	12.3	9.2	7.4	7.0	6.7	6.6	7.1	8.5
Oklahoma, Okla.	4.8	5.8	5.3	5.5	6.0	5.9	5.6	6.0	6.8	8.9	10.0	9.5	9.7	10.1	9.5	8.9	8.4	7.2	5.7	4.9	4.4	4.8	5.1	4.5	6.8
Omaha, Nebr.	6.8	6.9	6.4	6.1	5.3	6.0	6.1	6.3	5.9	6.7	7.3	8.3	9.2	10.0	10.5	10.5	10.4	9.4	7.6	6.5	6.6	7.0	7.3	6.9	7.5
Oswego, N. Y.	11.8	12.2	12.1	12.3	12.9	12.5	12.1	12.6	13.1	13.6	14.0	13.9	13.6	13.3	12.9	12.7	12.3	12.1	11.3	11.5	12.0	11.9	11.8	11.9	12.5
Palestine, Tex.	4.3	4.8	4.9	4.4	4.4	4.8	4.5	4.6	5.2	6.8	7.6	7.2	7.1	6.6	6.7	6.6	6.5	5.8	4.4	3.5	3.9	4.6	4.6	4.9	5.4
Parkersburg, W. Va.	3.9	3.3	3.3	3.1	3.5	3.5	3.6	3.7	4.5	5.8	7.4	8.6	8.9	8.8	8.8	8.7	7.7	5.9	4.5	4.3	4.7	4.5	3.8	4.3	5.4

TABLE VI.—*Average wind movement, etc.*—Continued.

Stations.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	Midnight.	Mean.
Pensacola, Fla.	10.2	10.0	10.2	10.6	10.5	10.0	10.1	9.1	9.5	10.2	10.5	9.7	9.9	10.6	10.3	11.0	10.4	9.4	7.9	8.3	8.4	9.0	9.4	9.6	9.8
Philadelphia, Pa.	9.5	8.5	8.4	8.3	8.0	8.4	8.2	9.7	11.1	12.0	12.4	12.4	13.3	13.6	14.3	13.8	12.9	11.6	10.5	10.3	10.8	9.9	10.1	10.1	10.8
Phœnix, Ariz.	3.4	2.9	2.6	3.1	2.8	3.5	3.4	4.2	4.3	4.4	4.9	5.2	5.8	6.5	6.2	5.8	5.5	5.0	4.0	3.0	3.5	4.5	4.8	3.6	4.3
Pierre, S. Dak.	6.3	5.8	6.3	6.1	5.4	6.0	6.2	6.0	5.5	5.7	7.8	9.3	11.4	12.0	12.7	12.9	13.0	12.2	10.5	8.4	7.4	6.2	5.6	5.9	8.1
Pittsburg, Pa.	4.6	4.6	5.0	5.1	5.4	5.5	5.5	5.4	6.7	8.1	8.8	9.5	9.3	9.4	9.7	8.7	8.6	7.5	6.9	6.4	5.6	5.2	4.8	4.8	6.7
Port Angeles, Wash.	4.4	4.2	4.0	3.8	4.0	4.0	4.3	4.5	4.5	4.2	3.9	3.3	3.1	3.6	4.1	4.2	3.8	4.0	3.5	3.3	3.7	4.1	4.2	4.4	4.0
Port Huron, Mich.	10.7	11.1	11.5	11.3	11.3	11.5	11.7	11.7	12.7	14.9	16.3	15.9	16.0	17.1	15.7	15.5	14.0	11.1	10.6	11.3	11.3	11.6	11.5	11.1	12.8
Portland, Me.	7.4	7.0	7.0	7.2	6.9	6.9	7.8	7.6	8.3	9.4	9.9	10.5	11.1	11.4	11.3	10.2	9.0	8.3	8.4	8.2	7.9	7.7	7.5	7.6	8.5
Portland, Oreg.	6.9	6.6	6.8	6.1	5.9	5.5	6.0	5.6	5.4	5.3	5.2	5.3	5.6	6.2	6.6	7.7	8.7	9.5	9.5	8.5	7.8	7.5	7.2	7.2	6.8
Pueblo, Colo.	6.0	5.6	5.4	5.0	4.8	4.8	4.9	5.1	4.2	3.8	5.0	7.3	8.4	9.2	9.4	9.7	9.6	9.6	7.8	6.0	5.7	5.2	5.2	5.7	6.4
Raleigh, N. C.	5.0	5.5	4.8	4.8	5.1	5.1	5.1	6.0	6.9	8.1	8.4	8.0	8.4	8.5	8.3	8.0	6.6	5.0	4.2	4.4	4.4	4.5	4.7	4.8	6.0
Rapid City, S. Dak.	8.6	8.5	8.8	7.7	7.5	7.5	8.4	9.4	9.0	8.4	8.7	10.7	12.9	13.3	13.7	13.6	13.6	12.5	10.7	7.4	7.1	7.8	8.6	9.1	9.7
Red Bluff, Cal.	4.4	4.1	4.3	4.7	4.4	4.9	4.7	4.5	4.8	4.8	3.9	4.5	5.2	5.5	5.1	5.4	5.2	5.2	5.5	5.1	4.8	4.5	3.8	4.1	4.7
Rochester, N. Y.	7.3	7.2	7.1	7.1	7.2	7.0	7.4	8.2	9.5	10.9	11.3	11.5	11.8	11.5	11.4	10.2	9.3	8.2	7.1	6.7	7.1	7.2	7.3	6.7	8.6
Roseburg, Oreg.	1.4	1.4	1.3	1.1	1.2	1.4	1.3	1.2	1.4	1.6	1.6	1.7	2.1	3.0	3.2	3.8	4.2	4.8	4.7	4.3	2.7	2.2	2.0	1.4	2.3
Sacramento, Cal.	6.9	6.9	7.7	7.9	7.9	7.5	7.0	6.5	6.7	6.0	5.0	5.2	5.5	6.2	6.5	7.3	7.0	6.6	6.4	5.9	6.2	6.5	7.4	7.5	6.7
St. Louis, Mo.	8.3	8.1	8.0	7.5	8.0	8.0	8.0	8.0	9.5	10.2	10.7	10.5	11.2	10.8	11.5	11.6	11.5	10.6	9.6	8.7	8.6	8.4	8.5	8.9	9.4
St. Paul, Minn.	6.7	6.6	6.9	6.6	7.0	7.0	7.1	7.3	7.7	9.3	10.3	11.2	11.6	12.1	11.9	12.6	11.7	10.1	9.0	8.2	8.7	8.2	7.7	7.1	8.9
St. Vincent, Minn.	8.3	8.0	8.3	8.7	9.4	9.5	8.9	9.4	9.1	10.9	11.8	12.3	13.1	14.2	14.1	13.6	12.1	11.0	9.5	8.4	8.0	8.3	8.0	8.1	10.1
Salt Lake City, Utah.	4.8	5.2	5.1	4.9	4.7	4.4	4.4	4.8	4.5	4.0	4.1	4.3	4.6	6.0	7.3	7.8	8.5	8.7	7.2	5.2	4.1	4.2	4.4	4.7	5.3
San Antonio, Tex.	7.7	6.8	6.6	6.5	6.6	7.0	6.9	6.5	6.1	6.5	7.5	8.5	8.8	8.8	9.1	9.3	8.9	9.1	7.8	7.4	7.5	7.6	7.8	7.6	7.6
San Diego, Cal.	2.9	3.2	3.1	2.9	2.9	3.1	3.3	3.2	3.1	3.0	3.1	4.1	5.7	7.6	9.5	10.1	10.5	9.9	8.9	7.5	5.7	4.3	3.3	3.0	5.2
Sandusky, Ohio	8.8	8.5	9.2	9.3	9.3	9.9	10.3	10.5	10.4	11.2	11.6	11.9	11.9	11.7	11.8	11.7	10.8	9.0	8.4	8.4	8.3	9.0	9.0	8.8	10.0
San Francisco, Cal.	8.4	7.5	7.4	6.2	5.5	5.4	5.5	5.6	5.6	5.4	5.0	4.6	4.9	6.0	7.3	9.4	11.7	13.7	15.1	16.9	15.6	14.4	12.0	10.0	8.7
San Luis Obispo, Cal.	2.2	2.3	2.6	2.2	2.1	2.8	2.5	2.5	2.3	2.1	2.3	2.7	3.1	4.0	5.5	6.3	7.2	7.0	6.4	5.9	4.6	3.9	2.8	2.3	3.7
Santa Fe, N. Mex.	6.4	5.3	4.3	3.9	2.9	3.4	3.1	3.1	3.1	3.4	4.5	6.1	6.8	7.3	7.5	7.3	7.6	7.8	7.6	5.9	5.3	6.0	6.3	6.6	5.5
Sault Ste Marie, Mich.	7.8	7.5	8.0	7.3	8.3	8.1	7.5	8.1	8.7	9.3	9.0	10.9	12.0	12.6	12.6	12.9	11.9	11.7	10.8	10.1	9.2	9.2	8.7	8.3	9.6
Savannah, Ga.	6.9	6.9	6.8	6.6	6.9	7.0	7.4	7.6	8.2	9.7	10.2	10.0	10.6	10.1	10.3	10.1	9.8	7.7	7.0	7.0	7.4	7.5	7.4	7.1	8.2
Seattle, Wash.	2.0	2.3	2.0	2.2	1.9	2.3	2.4	2.6	2.5	2.6	2.9	2.7	3.1	3.4	3.9	4.2	3.9	4.5	4.3	4.6	4.1	3.1	3.5	2.3	3.0
Shreveport, La.	4.6	4.4	4.2	4.2	4.5	4.4	4.6	4.6	4.5	5.7	6.8	7.3	7.0	7.1	7.0	7.6	7.4	6.7	5.8	5.1	5.0	4.9	4.6	4.5	5.5
Sioux City, Iowa.	8.0	7.7	7.3	7.0	6.9	8.5	7.8	8.2	8.3	9.7	11.4	13.6	14.9	16.4	16.9	16.5	16.2	14.4	11.0	9.5	9.5	9.0	8.5	8.0	10.6
Spokane, Wash.	2.6	2.6	2.4	2.1	2.6	2.5	2.3	2.3	2.4	2.3	2.5	3.5	3.8	4.7	4.5	4.1	3.6	3.5	3.8	3.0	2.5	2.3	2.1	2.4	2.9
Springfield, Ill.	7.6	7.8	8.2	8.6	8.3	8.5	8.4	8.8	9.3	10.7	11.1	11.2	11.6	11.5	11.9	11.9	11.5	9.6	7.3	7.2	7.4	7.9	8.3	8.5	9.3
Springfield, Mo.	7.3	7.5	7.7	7.5	7.6	7.2	7.4	7.6	7.8	9.1	9.8	9.9	9.7	10.1	10.3	9.7	9.5	7.9	6.5	6.8	6.9	7.2	7.3	7.1	8.1
Tampa, Fla.	5.8	5.5	5.4	5.5	5.9	6.0	6.0	6.2	7.5	9.0	9.3	9.3	9.0	9.3	9.0	9.5	8.9	7.8	6.7	5.8	5.5	6.1	5.6	5.6	7.1
Tatoosh Island, Wash.	10.8	10.8	11.4	12.4	12.7	12.0	11.3	11.8	11.5	12.5	13.2	12.6	12.9	13.9	13.7	12.9	11.9	10.6	10.1	10.1	10.4	11.4	11.3	11.4	11.8
Titusville, Fla.	12.3	12.2	12.1	11.5	11.6	12.1	13.5	13.7	14.7	16.3	17.2	16.9	17.5	18.3	18.2	18.3	18.5	17.8	16.8	16.8	15.5	14.5	12.9	12.2	15.1
Toledo, Ohio.	8.9	8.8	9.2	9.5	9.7	10.1	10.7	9.9	11.0	11.9	13.1	13.8	14.7	14.3	14.0	13.8	12.8	11.2	9.2	8.4	8.3	8.4	9.0	8.9	10.8
Vicksburg, Miss.	5.4	4.7	4.6	4.4	4.4	4.8	4.7	4.8	5.1	6.2	6.6	6.1	6.1	6.7	6.7	7.5	7.2	5.6	4.5	4.5	4.8	5.3	5.5	5.5	5.5
Vineyard Haven, Mass.	8.5	8.6	9.5	9.1	8.7	8.7	8.5	9.1	10.0	10.5	11.3	11.5	11.4	11.4	11.0	10.3	9.4	8.5	8.3	8.7	8.5	8.8	9.2	8.9	9.5
Walla Walla, Wash.	4.0	3.9	3.8	3.7	3.5	4.0	3.4	3.1	3.3	3.4	2.6	2.7	3.2	3.9	3.8	4.1	4.0	3.7	3.1	2.3	2.9	4.2	4.2	4.4	3.6
Washington, D. C.	5.2	5.1	5.1	4.5	4.8	4.5	4.5	4.6	6.2	8.1	9.3	10.9	11.8	12.0	11.5	11.2	9.3	7.0	5.7	5.8	6.2	5.8	5.7	5.6	7.1
Wichita, Kans.	6.6	6.8	6.5	6.1	6.0	5.9	6.1	6.3	6.5	7.6	9.2	9.9	9.7	9.0	9.1	8.7	8.1	7.5	5.3	4.3	4.8	6.0	5.9	6.2	7.0
Williston, N. Dak.	5.6	7.0	6.5	6.6	5.8	6.3	6.2	6.5	6.4	7.0	9.3	11.5	13.0	15.5	15.4	16.4	16.7	15.6	12.5	10.5	8.1	7.4	6.9	5.7	9.5
Wilmington, N. C.	6.9	7.4	7.6	7.6	7.6	7.8	8.2	8.3	9.1	10.5	11.1	11.0	11.1	10.5	10.6	11.5	10.2	7.5	7.2	7.2	6.5	6.6	6.5	6.8	8.5
Winnemucca, Nev.	8.1	8.1	8.0	8.3	8.6	8.2	8.6	8.4	8.0	7.9	7.9	8.2	8.6	8.1	8.0	7.4	8.0	8.4	8.9	7.4	5.5	6.0	6.5	7.5	7.9
Woods Hole, Mass.	17.1	17.5	17.9	17.6	17.0	16.8	17.6	17.2	17.2	17.2	16.7	16.7	17.0	17.5	17.3	16.8	15.7	15.5	16.3	16.4	16.3	17.0	17.2	16.7	16.9
Yuma, Ariz.	4.0	4.5	3.6	3.5	3.5	3.8	3.9	4.5	4.3	4.3	4.4	5.0	6.0	6.6	6.4	6.5	6.4	6.2	7.2	6.7	5.6	5.0	5.2	5.0	5.1

TABLE VII.—*Heights of rivers above low-water mark, October*, 1895.

Stations.	Distance to mouth of river.	Danger-point on gauge.	Highest water.		Lowest water.		Me'n stage.	Monthly range.
			Height.	Date.	Height.	Date.		
Mississippi River.	*Miles.*	*Feet.*	*Feet.*		*Feet.*		*Feet.*	*Feet*
St. Paul, Minn.	2,057	14.0	2.4	1	1.2	28	1.8	1.2
La Crosse, Wis.	1,867	10.0	4.4	2,3	1.7	31	2.8	2.7
Dubuque, Iowa	1,759	15.0	3.6	6	1.2	29-31	2.3	2.4
Davenport, Iowa	1,653	15.0	2.4	8,9	0.8	30,31	1.6	1.6
Keokuk, Iowa	1,533	14.0	1.8	11-13	— 0.1	1	0.9	1.9
Hannibal, Mo.	1,462	17.0	2.2	12-16	0.3	1	1.4	1.9
St. Louis, Mo.	1,321	30.0	3.9	6,7,14-16	2.6	30,31	3.4	1.3
Memphis, Tenn.	910	33.0	— 0.6	1	— 2.3	30,31	—1.6	1.7
Helena, Ark.	834	37.0	0.7	1	— 2.4	30,31	—1.2	3.1
Arkansas City, Ark.	702	42.0	2.6	1	— 2.4	30,31	—0.7	5.0
Greenville, Miss.	662	40.0	2.3	1	— 1.8	31	—0.3	4.1
Vicksburg, Miss.	541	41.0	1.0	1	— 5.0	30,31	—3.2	6.0
New Orleans, La.	108	13.0	4.9	11	2.8	18	3.6	2.1
Illinois River.								
Beardstown, Ill.	76	12.0	6.4	22-24	6.0	5-14	6.2	0.4
Missouri River.								
Pierre, S. Dak.	1,132	13.0	1.8	18	1.1	31	1.6	0.7
Sioux City, Iowa.	802	18.7	5.8	28-30	5.7	1-27,31	5.7	0.1
Omaha, Nebr.	667	18.0						
Kansas City, Mo.	366	21.0	7.3	2	5.5	14,18-23,26	5.8	1.8
Ohio River.								
Parkersburg, W. Va.	786	38.0	1.7	8	0.7	30,31	1.1	1.0
Catlettsburg, Ky.	652	50.0	2.4	1	0.9	16,17,21-23	1.2	1.5
Cincinnati, Ohio	500	45.0	4.4	1,2	2.3	27,28	3.0	2.1
Louisville, Ky.	368	24.0	3.4	3,5,6	1.8	25-31	2.5	1.6
Evansville, Ind.	184	30.0	1.1	1,2	— 0.2	25-31	0.4	1.3
Paducah, Ky.	47	40.0	0.7	1	— 0.7	30,31	—0.2	1.4
Cairo, Ill.	1,140*	40.0	3.2	1	1.4	28,31	2.3	1.8
Monongahela River.								
Pittsburg, Pa.	966†	22.0	6.0	30,31	4.8	5,7,8	5.2	1.2
Great Kanawha River.								
Charleston, W. Va.	61	30.0	4.8	11,14-20	4.3	3,4	4.6	0.5

Stations.	Distance to mouth of river.	Danger-point on gauge.	Highest water.		Lowest water.		Me'n stage.	Monthly range.
			Height.	Date.	Height.	Date.		
Scioto River.	*Miles.*	*Feet.*	*Feet.*		*Feet.*		*Feet.*	*Feet.*
Circleville, Ohio	65	13.0	0.9	1,2	0.2	25-31	0.4	0.7
Big Sandy River.								
Louisa, Ky.			2.0	1,2,20,21	1.6	30,31	1.8	0.4
Wabash River.								
Mount Carmel, Ill.	50	15.0	0.4	1-3	—0.1	24-31	0.1	0.5
Cumberland River.								
Burnside, Ky.	404	50.0	1.3	1	—1.5	25	—0.1	2.8
Nashville, Tenn.	145	40.0	0.9	1	0.1	29,30	0.4	0.8
Tennessee River.								
Knoxville, Tenn.	640	20.0						
Chattanooga, Tenn.	455	33.0	1.0	11-14, 16-18, 31	0.7	23-30	8.5	0.3
Johnsonville, Tenn.	94	21.0	0.6	1	0.0	28-31	0.2	0.6
Arkansas River.								
Fort Smith, Ark.	351	22.0	3.4	2	1.3	25-31	1.9	2.1
Little Rock, Ark.	176	23.0	4.3	1,4-6	2.9	31	3.4	1.4
Red River.								
Shreveport, La.	449	29.2	—1.1	23	—3.7	19	—2.7	2.6
James River.								
Lynchburg, Va.	251	18.0	0.0	1-3,8-21,31	—0.1	4-7,22-30	0.0	0.1
Congaree River.								
Columbia, S. C.		15.0	1.0	12	0.1	2,3,6,7	0.4	0.9
Savannah River.								
Augusta, Ga.	140	32.6	5.5	25	4.4	26	4.8	1.1
Alabama River.								
Montgomery, Ala.	215	48.0	1.0	11,12	—0.2	27	0.3	1.2
Willamette River.								
Portland, Oreg.		15.0	2.6	20-22	—0.1	28	1.4	2.7
Sacramento River.								
Red Bluff, Cal.		20.0	1.1	21	0.7	1-18	0.8	0.4
Sacramento, Cal.		28.0	9.3	1	8.5	16,17,31	8.7	0.8

*To mouth of Mississippi River.

†To mouth of Ohio River.

TABLE VIII.—*Temperature of the wet-bulb thermometer, October, 1895.*

Stations.	Local time faster or slower than 75th meridian time.	8 A. M.			8 P. M.		
		Max.	Min.	Mean.	Max.	Min.	Mean.
New England.	h. m.	°	°	°	°	°	°
Eastport, Me	32 F.	54	36	40.7	54	36	41.3
Portland, Me	19 F.	55	26	40.2	56	30	42.6
Northfield, Vt	9 F.	51	18	35.2	54	23	36.7
Boston, Mass	16 F.	59	31	43.4	56	32	44.5
Nantucket, Mass	20 F.	61	36	48.0	58	33	46.9
Woods Hole, Mass	17 F.	.....	.....	.....	58	32	46.5
Block Island, R. I	14 F.	62	34	46.9	61	35	47.3
New Haven, Conn	8 F.	60	30	41.9	60	31	44.7
Middle Atlantic States.							
Albany, N. Y	5 F.	54	30	40.8	56	31	42.7
New York, N. Y	4 F.	59	33	43.4	58	35	47.5
Harrisburg, Pa	7 S.	54	28	40.6	61	35	45.5
Philadelphia, Pa	0	58	32	43.4	58	36	46.3
Baltimore, Md	6 S.	54	32	42.5	59	35	46.7
Washington, D. C	8 S.	53	30	42.5	59	33	45.5
Lynchburg, Va	16 S.	54	31	41.8	62	36	42.8
Norfolk, Va	5 S.	64	38	50.1	64	42	51.7
South Atlantic States.							
Charlotte, N. C	23 S.	62	31	44.6	69	38	48.2
Hatteras, N. C	2 S.	70	47	57.9	71	43	57.3
Kittyhawk, N. C	3 S.	66	44	55.0	68	42	55.7
Raleigh, N. C	14 S.	63	33	45.9	63	39	49.6
Wilmington, N. C	12 S.	68	40	52.7	68	42	54.8
Charleston, S. C	20 S.	68	45	55.6	71	49	59.3
Augusta, Ga	27 S.	64	38	48.4	67	45	53.7
Savannah, Ga	24 S.	70	46	55.4	70	50	59.2
Jacksonville, Fla	26 S.	70	53	60.6	70	57	64.3
Florida Peninsula.							
Jupiter, Fla	20 S.	75	63	71.3	75	64	70.9
Key West, Fla	27 S.	77	69	73.8	78	69	74.2
Tampa, Fla	30 S.	73	57	65.5	73	62	67.1
Titusville, Fla	33 S.	75	60	68.3	75	60	69.5
Eastern Gulf States.							
Atlanta, Ga	37 S.	59	39	48.1	64	44	53.9
Pensacola, Fla	49 S.	71	46	56.1	73	50	60.7
Mobile, Ala	52 S.	70	44	54.3	74	50	59.6
Montgomery, Ala	45 S.	62	41	50.0	65	46	55.4
Meridian, Miss	55 S.	62	37	46.4	65	45	53.8
Vicksburg, Miss	1 08 S.	64	41	49.3	66	44	55.3
New Orleans, La	1 00 S.	70	46	57.2	70	50	61.0
Western Gulf States.							
Shreveport, La	1 14 S.	66	40	49.3	67	44	56.5
Fort Smith, Ark	1 17 S.	64	33	44.6	68	42	52.5
Little Rock, Ark	1 08 S.	65	36	45.9	66	38	52.6
Corpus Christi, Tex	1 30 S.	76	52	62.5	78	52	67.7
Galveston, Tex	1 19 S.	73	52	62.2	73	48	64.2
Palestine, Tex	1 22 S.	64	39	50.6	71	45	58.1
San Antonio, Tex	1 34 S.	72	43	58.5	73	46	58.2
Ohio Valley and Tenn.							
Chattanooga, Tenn	41 S.	60	33	43.9	64	39	51.0
Knoxville, Tenn	36 S.	58	32	42.4	63	39	49.5
Memphis, Tenn	1 00 S.	62	34	45.5	68	40	53.3
Nashville, Tenn	47 S.	62	30	42.1	63	38	50.1
Lexington, Ky	38 S.	59	28	39.2	56	29	44.0
Louisville, Ky	43 S.	60	25	39.0	59	32	46.4
Indianapolis, Ind	44 S.	56	22	38.6	58	29	43.4
Cincinnati, Ohio	38 S.	59	26	38.7	56	30	44.0
Columbus, Ohio	32 S.	58	20	37.7	54	31	43.6
Pittsburg, Pa	20 S.	52	28	40.2	57	30	45.1
Parkersburg, W. Va	26 S.	54	21	37.2	57	31	44.2
Lower Lake Region.							
Buffalo, N. Y	15 S.	51	27	39.6	53	29	41.2
Oswego, N. Y	6 S.	48	28	38.5	55	28	41.2
Rochester, N. Y	11 S.	48	27	38.2	54	28	40.9
Erie, Pa	20 S.	51	30	40.4	52	29	42.5
Cleveland, Ohio	27 S.	54	27	39.1	53	32	42.7
Sandusky, Ohio	30 S.	55	25	38.3	55	31	41.6
Toledo, Ohio	34 S.	55	24	36.6	55	28	41.1
Detroit, Mich	32 S.	53	24	36.7	52	28	40.4
Upper Lake Region.							
Alpena, Mich	34 S.	53	20	36.0	54	22	38.1
Grand Haven, Mich	45 S.	50	24	39.3	54	27	41.4
Marquette, Mich	49 S.	48	29	35.0	54	23	37.4
Port Huron, Mich	30 S.	50	22	36.0	53	29	40.1
Sault Ste. Marie, Mich	37 S.	47	18	34.5	52	24	36.8
Chicago, Ill	50 S.	54	23	36.7	55	29	41.6

Stations.	Local time faster or slower than 75th meridian time.	8 A. M.			8 P. M.		
		Max.	Min.	Mean.	Max.	Min.	Mean.
Up. Lake Region—Con.	h. m.	°	°	°	°	°	°
Milwaukee, Wis	51 S.	52	20	36.6	53	27	40.7
Green Bay, Wis	52 S.	46	16	32.9	52	25	38.8
Duluth, Minn	1 08 S.	48	17	33.8	52	22	37.4
North Dakota.							
Moorhead, Minn	1 27 S.	46	3	28.5	54	16	36.8
St. Vincent, Minn	1 29 S.	46	17	29.0	52	15	35.1
Bismarck, N. Dak	1 42 S.	44	— 3	26.7	56	14	37.0
Williston, N. Dak	1 54 S.	40	— 4	27.5	50	11	36.9
Upper Mississippi Valley.							
St. Paul, Minn	1 12 S.	49	15	32.6	54	24	39.0
La Crosse, Wis	1 05 S.	49	16	34.2	56	26	41.0
Davenport, Iowa	1 02 S.	53	19	36.2	58	27	42.0
Des Moines, Iowa	1 14 S.	54	16	34.6	57	28	42.4
Keokuk, Iowa	1 06 S.	54	18	37.1	61	30	43.3
Cairo, Ill	56 S.	62	26	41.9	63	35	49.6
Springfield, Ill	58 S.	55	20	36.8	60	28	43.2
Hannibal, Mo	1 05 S.	57	22	37.1	60	30	44.2
St. Louis, Mo	1 01 S.	59	26	41.7	64	32	46.7
Missouri Valley.							
Columbia, Mo	1 09 S.	.....	.....	.....	61	28	44.6
Kansas City, Mo	1 18 S.	57	23	39.6	62	32	46.1
Springfield, Mo	1 13 S.	61	25	40.1	64	34	46.6
Omaha, Nebr	1 24 S.	56	15	35.9	57	27	43.1
Sioux City, Iowa	1 26 S.	53	13	33.0	54	22	40.9
Pierre, S. Dak	1 41 S.	50	3	33.0	59	20	45.0
Huron, S. Dak	1 32 S.	46	3	29.5	56	18	39.7
Northern Slope.							
Havre, Mont	2 19 S.	43	13	29.1	51	26	40.8
Miles City, Mont	2 03 S.	48	14	32.6	55	27	43.9
Helena, Mont	2 28 S.	46	23	33.5	56	36	42.3
Rapid City, S. Dak	1 53 S.	47	10	34.4	53	23	41.4
Cheyenne, Wyo	1 59 S.	46	12	30.8	48	28	37.5
Lander, Wyo	2 15 S.	41	10	27.3	50	26	38.7
North Platte, Nebr	1 43 S.	50	12	31.9	58	29	44.7
Middle Slope.							
Denver, Colo	2 00 S.	45	20	34.2	50	32	42.9
Pueblo, Colo	1 58 S.	43	20	33.3	52	32	44.0
Concordia, Kans	1 31 S.	55	18	37.3	57	30	46.1
Dodge City, Kans	1 40 S.	57	25	38.0	55	30	45.3
Wichita, Kans	1 29 S.	60	25	39.8	64	33	47.3
Oklahoma, Okla	1 30 S.	63	31	43.2	65	39	50.8
Southern Slope.							
Abilene, Tex	1 39 S.	64	35	47.4	70	41	52.9
Amarillo, Tex	1 47 S.	55	30	40.4	60	36	47.0
Southern Plateau.							
El Paso, Tex	2 06 S.	57	39	45.0	60	42	52.0
Santa Fe, N. Mex	2 04 S.	46	27	36.1	49	33	42.3
Phœnix, Ariz	2 28 S.	62	45	54.5	70	54	63.0
Yuma, Ariz	2 28 S.	73	48	56.1	71	56	63.0
Independence, Cal	2 53 S.	49	33	40.5	58	41	49.4
Middle Plateau.							
Carson City, Nev	2 59 S.	43	25	33.6	52	40	45.8
Winnemucca, Nev	2 51 S.	46	16	29.4	53	39	45.7
Salt Lake City, Utah	2 27 S.	50	32	40.8	56	40	49.0
Northern Plateau.							
Baker City, Oreg	2 51 S.	46	21	33.4	57	36	46.7
Idaho Falls, Idaho	2 28 S.	43	14	27.9	54	32	42.2
Spokane, Wash	2 49 S.	45	22	34.8	56	38	47.6
Walla Walla, Wash	2 53 S.	52	32	42.7	62	40	53.1
N. Pac. Coast Region.							
Fort Canby, Wash	3 16 S.	65	44	50.2	64	46	52.4
Port Angeles, Wash	3 14 S.	52	35	43.5	55	40	48.5
Seattle, Wash	3 09 S.	53	39	46.1	57	42	50.6
Tatoosh Island, Wash	3 19 S.	53	42	47.9	54	45	49.9
Portland, Oreg	3 11 S.	54	37	47.0	60	43	53.1
Roseburg, Oreg	3 13 S.	53	33	42.7	62	47	54.7
Mid. Pac. Coast Region.							
Eureka, Cal	3 17 S.	53	42	48.9	56	47	51.3
Red Bluff, Cal	3 09 S.	57	42	48.8	66	54	58.3
Sacramento, Cal	3 06 S.	56	43	50.5	67	56	60.4
San Francisco, Cal	3 10 S.	58	48	52.4	59	50	54.7
S. Pac. Coast Region.							
Fresno, Cal	2 59 S.	58	42	49.9	68	53	58.7
Los Angeles, Cal	2 53 S.	61	47	55.2	65	57	60.3
San Diego, Cal	2 49 S.	61	53	58.0	64	56	60.7
San Luis Obispo, Cal	3 03 S.	58	40	51.3	62	53	57.2

TABLE IX.—*Resultant winds from observations at 8 a. m. and 8 p. m., daily, during October, 1895.*

Stations.	Component direction from—				Resultant.		Stations.	Component direction from—				Resultant.	
	N.	S.	E.	W.	Direction from—	Duration.		N.	S.	E.	W.	Direction from—	Duration.
New England.	*Hours.*	*Hours.*	*Hours.*	*Hours.*	°	*Hours.*	*Upper Lake Region*—Cont'd.	*Hours.*	*Hours.*	*Hours.*	*Hours.*	°	*Hours.*
Eastport, Me	19	21	8	34	s. 83 w.	16	Milwaukee, Wis	19	20	4	33	s. 88 w.	29
Portland, Me	20	19	6	35	n. 88 w.	29	Green Bay, Wis	7	31	3	25	s. 48 w.	33
Northfield, Vt	20	32	4	19	s. 51 w.	19	Duluth, Minn	25	18	4	35	n. 77 w.	32
Boston, Mass	10	16	7	20	s. 65 w.	14	*North Dakota.*						
Nantucket, Mass	24	14	17	21	n. 22 w.	11	Moorhead, Minn	29	19	5	20	n. 56 w.	18
Woods Hole, Mass.*	11	8	4	13	n. 72 w.	10	St. Vincent, Minn	29	19	8	21	n. 52 w.	16
Block Island, R. I	24	12	11	32	n. 60 w.	24	Bismarck, N. Dak	28	14	11	30	n. 39 w.	31
New Haven, Conn	30	14	5	27	n. 40 w.	34	Williston, N. Dak	31	15	4	28	n. 56 w.	29
Middle Atlantic States.							*Upper Mississippi Valley.*						
Albany, N. Y	18	23	7	20	s. 69 w.	14	St. Paul, Minn	9	19	13	34	s. 65 w.	23
New York, N. Y	21	18	8	29	n. 82 w.	21	La Crosse, Wis	19	27	8	20	s. 56 w.	14
Harrisburg, Pa	17	14	12	25	n. 77 w.	13	Davenport, Iowa	12	30	11	28	s. 65 w.	19
Philadelphia, Pa	30	13	6	25	n. 48 w.	26	Des Moines, Iowa	25	17	11	28	n. 65 w.	19
Baltimore, Md	28	10	5	31	n. 55 w.	32	Keokuk, Iowa	19	21	8	29	s. 85 w.	31
Washington, D. C	29	15	5	23	n. 52 w.	23	Cairo, Ill	30	17	10	14	n. 17 w.	14
Lynchburg, Va	20	14	13	23	n. 59 w.	12	Springfield, Ill	19	21	7	27	s. 84 w.	30
Norfolk, Va	30	16	25	11	n. 45 e.	20	Hannibal, Mo	18	20	5	30	s. 85 w.	25
South Atlantic States.							St. Louis, Mo	25	30	11	21	n. 63 w.	11
Charlotte, N. C	23	20	31	8	n. 83 e.	23	*Missouri Valley.*						
Hatteras, N. C	37	7	19	14	n. 9 e.	30	Columbia, Mo.*	9	11	6	14	s. 76 w.	8
Kittyhawk, N. C	24	14	21	19	n. 11 e.	10	Kansas City, Mo	20	29	10	19	s. 45 w.	13
Raleigh, N. C	32	18	7	20	n. 43 w.	19	Springfield, Mo	23	21	16	16	n.	2
Wilmington, N. C	33	12	17	17	n.	21	Omaha, Nebr	25	22	11	23	n. 76 w.	12
Charleston, S. C	35	10	17	12	n. 11 e.	26	Sioux City, Iowa	25	23	13	18	n. 68 w.	5
Augusta, Ga	30	9	13	24	n. 28 w.	24	Pierre, S. Dak	22	14	21	16	n. 32 e.	9
Savannah, Ga	26	12	15	11	n. 9 e.	24	Huron, S. Dak	23	22	11	23	n. 85 w.	12
Jacksonville, Fla	37	8	25	11	n. 26 e.	32	*Northern Slope.*						
Florida Peninsula.							Havre, Mont	25	9	9	34	n. 57 w.	30
Jupiter, Fla	28	6	30	10	n. 42 e.	30	Miles City, Mont	19	21	13	17	s. 63 w.	4
Key West, Fla	29	5	38	3	n. 56 e.	42	Helena, Mont	10	31	4	30	s. 51 w.	33
Tampa, Fla	42	5	16	6	n. 15 e.	38	Rapid City, S. Dak	15	17	4	35	s. 87 w.	31
Titusville, Fla	33	7	25	11	n. 28 e.	30	Cheyenne, Wyo	28	18	5	33	n. 50 w.	23
Eastern Gulf States.							Lander, Wyo	12	27	7	30	s. 57 w.	28
Atlanta, Ga	31	8	19	28	n. 18 w.	29	North Platte, Nebr	12	24	14	25	s. 43 w.	16
Pensacola, Fla	37	7	18	15	n. 6 e.	30	*Middle Slope.*						
Mobile, Ala	42	10	4	15	n. 19 w.	34	Denver, Colo	19	27	14	13	s. 7 e.	8
Montgomery, Ala	34	8	18	13	n. 11 e.	26	Pueblo, Colo	26	9	21	21	n.	17
Meridian, Miss	40	8	24	5	n. 31 e.	37	Concordia, Kans	23	22	8	19	n. 85 w.	11
Vicksburg, Miss	34	8	33	6	n. 46 e.	38	Dodge City, Kans	24	25	21	9	n. 85 e.	12
New Orleans, La	35	10	23	12	n. 24 e.	27	Wichita, Kans	22	27	18	13	s. 45 e.	7
Western Gulf States.							Oklahoma, Okla	21	26	18	11	s. 54 e.	9
Shreveport, La	33	11	25	6	n. 41 e.	29	*Southern Slope.*						
Fort Smith, Ark	22	11	30	8	n. 64 e.	25	Abilene, Tex	27	22	17	7	n. 68 e.	11
Little Rock, Ark	30	13	13	20	n. 45 w.	24	Amarillo, Tex	16	36	12	4	s. 22 e.	22
Corpus Christi, Tex	26	18	26	5	n. 69 e.	22	*Southern Plateau.*						
Galveston, Tex	26	15	31	6	n. 66 e.	27	El Paso, Tex	16	12	40	10	n. 82 e.	30
Palestine, Tex	33	9	28	8	n. 40 e.	31	Santa Fe, N. Mex	16	28	23	19	s. 30 e.	8
San Antonio, Tex	43	10	14	3	n. 18 e.	35	Phœnix, Ariz	4	26	8	21	s. 30 w.	26
Ohio Valley and Tennessee.							Yuma, Ariz	26	18	19	18	n. 4 e.	13
Chattanooga, Tenn	18	16	14	27	n. 81 w.	13	Independence, Cal	20	14	11	29	n. 56 w.	22
Knoxville, Tenn	34	4	19	18	n. 2 e.	30	*Middle Plateau.*						
Memphis, Tenn	32	13	17	10	n. 20 e.	20	Carson City, Nev	19	15	20	18	n. 27 e.	4
Nashville, Tenn	30	10	7	31	n. 50 w.	31	Winnemucca, Nev	26	8	30	11	n. 47 e.	26
Lexington, Ky	17	17	17	21	n. 22 w.	11	Salt Lake City, Utah	16	18	18	25	s. 74 w.	7
Louisville, Ky	31	18	5	17	n. 43 w.	18	*Northern Plateau.*						
Indianapolis, Ind	24	18	11	27	n. 69 w.	17	Baker City, Oreg	6	31	6	3	s. 7 e.	25
Cincinnati, Ohio	24	18	14	21	n. 49 w.	9	Idaho Falls, Idaho	27	17	10	22	n. 50 w.	16
Columbus, Ohio	21	19	11	26	n. 82 w.	15	Spokane, Wash	26	17	20	12	n. 42 e.	12
Pittsburg, Pa	21	16	8	32	n. 78 w.	24	Walla Walla, Wash	2	34	20	18	s. 4 e.	32
Parkersburg, W. Va	12	23	16	22	s. 29 w.	12	*North Pacific Coast Region.*						
Lower Lake Region.							Fort Canby, Wash	29	12	15	13	n. 7 e.	17
Buffalo, N. Y	15	21	12	31	s. 72 w.	20	Port Angeles, Wash	6	36	19	14	s. 9 e.	30
Oswego, N. Y	12	29	10	22	s. 35 w.	21	Seattle, Wash	30	16	15	10	n. 20 e.	15
Rochester, N. Y	9	29	4	33	s. 55 w.	35	Tatoosh Island, Wash	2	15	37	12	s. 63 e.	28
Erie, Pa	18	30	7	23	s. 53 w.	20	Portland, Oreg	34	8	9	30	n. 39 w.	33
Cleveland, Ohio	12	28	18	17	s. 3 e.	16	Roseburg, Oreg	24	8	11	31	n. 51 w.	26
Sandusky, Ohio	16	20	8	34	s. 81 w.	26	*Middle Pacific Coast Region.*						
Toledo, Ohio	14	13	5	40	n. 88 w.	35	Eureka, Cal	25	13	14	19	n. 21 w.	14
Detroit, Mich	15	19	6	41	s. 83 w.	35	Red Bluff, Cal	27	19	15	19	n. 27 w.	9
Upper Lake Region.							Sacramento, Cal	18	30	12	15	s. 14 w.	12
Alpena, Mich	15	23	9	34	s. 72 w.	26	San Francisco, Cal	5	10	2	52	s. 84 w.	50
Grand Haven, Mich	23	20	10	25	n. 79 w.	15	*South Pacific Coast Region.*						
Marquette, Mich	21	16	3	34	n. 81 w.	31	Fresno, Cal	27	7	9	37	n. 54 w.	34
Port Huron, Mich	13	34	3	24	s. 45 w.	30	Los Angeles, Cal	15	5	14	33	n. 62 w.	22
Sault Ste. Marie, Mich	20	19	17	23	n. 80 w.	6	San Diego, Cal	33	11	9	26	n. 38 w.	28
Chicago, Ill	18	22	4	29	s. 81 w.	35	San Luis Obispo, Cal	30	16	6	20	n. 45 w.	20

* From observations at 8 p. m. only.

TABLE X.—*Thunderstorms and auroras, October, 1895.*

States.	No. of stations.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total. No.	Total. Days.	
Alabama	55	T.							4				1																					5	2	T.
		A.																																0	0	A.
Arizona	43	T.			6	2													1										5	7	1			22	6	T.
		A.																																0	0	A.
Arkansas	50	T.				1		1																				3	2					7	4	T.
		A.																																0	0	A.
California	195	T.											1			7	15	1	2	2	7	7	1						1					44	10	T.
		A.																																0	0	A.
Colorado	86	T.	1		9											1	2			2	1		5	1	1									23	9	T.
		A.		1									4	1						1														7	4	T.
Connecticut	22	T.																											1					1	1	T.
		A.														4																		4	1	T.
Delaware	7	T.																																0	0	A.
		A.									1									1			1											3	3	T.
Dist. of Columbia	4	T.																																0	0	A.
		A.																																0	0	A.
Florida	36	T.										1					2											1			1	1	2	8	6	T.
		A.																																0	0	A.
Georgia	58	T.																											5					5	1	T.
		A.																																0	0	A.
Idaho	32	T.		1																														1	1	T.
		A.										1		7	5	1	1				1							1						17	7	T.
Illinois	92	T.						3					2														1	4	3					13	5	T.
		A.												21	10			4							1									36	4	T.
Indiana	44	T.						1					6																1					8	3	T.
		A.											1	5	1																			7	3	T.
Indian Territory	8	T.					1	1																				1						3	3	T.
		A.																																0	0	A.
Iowa	90	T.											2															2						4	2	T.
		A.										1		28	18		1	6			1													55	6	T.
Kansas	68	T.																					1	1				1						3	3	T.
		A.											1	6								1												8	3	T.
Kentucky	40	T.											3										1											4	2	T.
		A.																																0	0	A.
Louisiana	56	T.						1	6	1																			2		1			11	5	T.
		A.																																0	0	A.
Maine	19	T.																												2				2	1	T.
		A.														5												1						6	2	T.
Maryland	36	T.																																0	0	A.
		A.												1				1																2	2	T.
Massachusetts	83	T.																											4					4	1	T.
		A.	1													12			1														14	3	T.
Michigan	85	T.										1																	1					2	2	T.
		A.									1		14	11	1							1												28	5	T.
Minnesota	70	T.										2																						2	1	T.
		A.	2	1								1	2	27	18	8		14	1	1	1		1	4			1				1			83	15	T.
Mississippi	51	T.							5																				3			2	1	11	4	T.
		A.																																0	0	A.
Missouri	96	T.					1																	2				14	4			1		22	5	T.
		A.												4	2																			6	2	T.
Montana	36	T.		1																														1	1	T.
		A.	1								1		1	6	2	2	1	3	2					1	3		1	1						25	13	T.
Nebraska	125	T.																																0	0	A.
		A.												13	13	1				1					1									29	5	T.
Nevada	51	T.														1	8	9	2		2	2	3											27	7	T.
		A.																																0	0	A.
New Hampshire	24	T.																																0	0	A.
		A.												1		7	1																	9	3	T.
New Jersey	53	T.																																0	0	A.
		A.												1	2	6	2											1						12	5	T.
New Mexico	33	T.				1																							1		3			5	3	T.
		A.																																0	0	A.
New York	84	T.																										1	1					2	2	T.
		A.	1		2	1								10	17					1														32	6	T.
North Carolina	58	T.																																0	0	A.
		A.																																0	0	A.
North Dakota	36	T.																																0	0	A.
		A.	1									1	1	9	3	7	2	9	1		2	1	1	4	1					1	1			45	16	T.
Ohio	139	T.											9													1			24	1			1	36	5	T.
		A.							1			2	27	9	9	1	2	1													1			53	9	T.
Oklahoma	30	T.						2																										2	1	T.
		A.																																0	0	A.
Oregon	65	T.																																0	0	A.
		A.																																0	0	A.
Pennsylvania	104	T.											1																2					3	2	T.
		A.										1	2	2	2																			7	4	T.
Rhode Island	8	T.																																0	0	A.
		A.													3																			3	1	T.
South Carolina	40	T.							2	3																								5	2	T.
		A.																																0	0	A.
South Dakota	44	T.						1				2																						3	2	T.
		A.											11	4	3		4	1																23	5	T.
Tennessee	45	T.										1																3						4	2	T.
		A.																																0	0	A.
Texas	90	T.				1	2	4	6																			1		1	5	1		21	8	T.
		A.																																0	0	A.
Utah	34	T.																			4	2	3	1										10	4	T.
		A.																																0	0	A.
Vermont	16	T.																											1					1	1	T.
		A.														5													1		3			9	3	T.
Virginia	88	T.																																0	0	A.
		A.																																0	0	A.
Washington	42	T.																																0	0	A.
		A.												4	3		2												1					10	4	T.
West Virginia	38	T.																																0	0	A.
		A.																																0	0	A.
Wisconsin	80	T.												2	1	1																		4	3	T.
		A.	1										25	16	2	2	9	3			1		3								1		61	10	A.
Wyoming	11	T.	1	1																														2	2	T.
		A.											2	1																				3	2	A.
Sums	2,796	T.	2	3	15	5	4	14	23	4	0	6	24	4	1	10	27	10	5	4	14	11	14	5	1	1	1	26	59	17	7	9	5	331	....	T.
		A.	7	2	2	1	0	0	1	0	3	4	9	215	132	95	13	52	10	5	5	4	3	12	5	1	2	3	1	3	2	4	1	597	..	A.

TABLE XI.—*Hourly sunshine as deduced from sunshine recorders, October*, 1895.

Stations.	Instrument.	Percentages for each hour of local mean time ending with the respective hour.																		Monthly summary.			
		A. M.								P. M.								Instrumental record.			Personal estimate.
		5	6	7	8	9	10	11	Noon.	1	2	3	4	5	6	7	8	Actual.	Possible.	Per cent of possible.	
																		Hours.	*Hours.*		
Atlanta, Ga	T.	.....	50	65	67	73	79	84	85	85	86	81	78	72	80	.....	.....	273.2	350.8	78	74
Baltimore, Md	T.	.....	70	50	50	61	79	82	78	85	86	84	71	65	73	.....	.....	249.4	345.9	72	76
Bismarck, N. Dak	P.	.....	.....	43	59	75	85	85	85	73	73	71	74	53	44	.....	.....	238.6	337.0	71	58
Boston, Mass	T.	.....	100	50	57	60	63	69	68	71	63	60	57	51	43	.....	.....	207.7	342.5	61	54
Buffalo, N. Y	T.	.....	33	16	15	25	47	45	53	49	49	50	40	23	26	.....	.....	128.9	342.2	38	35
Chicago, Ill	T.	.....	100	65	68	78	86	83	84	83	79	78	73	68	71	.....	.....	263.8	342.8	77	65
Cincinnati, Ohio	T.	.....	100	94	92	87	82	85	83	85	85	82	79	76	74	.....	.....	290.8	346.0	84	70
Cleveland, Ohio	P.	.....	44	52	55	63	72	68	62	65	64	62	63	43	46	.....	.....	208.4	343.6	61	54
Columbus, Ohio	T.	.....	100	26	26	43	70	71	75	75	67	67	56	40	38	.....	.....	198.4	345.1	56	47
Denver, Colo	P.	.....	80	78	82	86	89	90	91	86	86	83	79	69	61	.....	.....	287.5	345.3	83	64
Des Moines, Iowa	T.	.....	100	74	75	79	85	87	92	94	95	84	85	66	70	.....	.....	285.2	343.1	83	71
Detroit, Mich	T.	.....	100	42	52	71	76	75	76	79	74	75	65	51	51	.....	.....	229.4	342.2	67	57
Dodge City, Kans	P.	.....	50	69	75	77	77	79	79	83	83	78	80	75	64	.....	.....	268.5	347.3	77	70
Eastport, Me	P.	.....	100	39	41	52	58	63	57	58	55	55	49	41	51	.....	.....	176.0	339.7	52	36
Galveston, Tex	P.	.....	25	42	67	74	79	87	84	82	80	78	79	79	58	.....	.....	266.1	355.4	75	74
Helena, Mont	P.	.....	.....	54	63	66	79	78	79	89	91	87	82	72	79	.....	.....	260.5	337.0	77	62
Kansas City, Mo	P.	.....	75	69	75	76	79	78	82	82	81	78	73	67	71	.....	.....	263.6	346.1	76	72
Little Rock, Ark	T.	.....	67	69	67	74	80	81	84	81	78	79	70	62	65	.....	.....	261.4	349.9	75	65
Louisville, Ky	T.	.....	87	86	84	83	81	80	85	80	76	69	68	70	72	.....	.....	270.7	346.7	78	74
Marquette, Mich	T.	.....	.....	6	22	36	42	41	37	32	39	36	29	16	4	.....	.....	104.1	337.4	31	21
New Orleans, La	T.	.....	57	53	67	83	88	89	89	89	87	85	84	71	71	.....	.....	284.0	354.6	80	80
New York, N. Y	T.	.....	100	53	60	68	72	78	77	79	77	78	73	57	54	.....	.....	241.4	344.0	70	64
Philadelphia, Pa	T.	.....	100	63	69	70	77	82	82	82	80	79	75	73	77	.....	.....	302.0	345.4	76	69
Phœnix, Ariz	P.	.....	100	84	85	88	87	89	91	94	91	93	91	80	68	.....	.....	307.5	351.2	88	71
Portland, Me	T.	.....	0	5	33	56	73	76	69	68	61	55	51	23	7	.....	.....	176.8	341.7	52	44
Portland, Oreg	T.	.....	0	43	41	42	47	63	78	81	83	72	55	74	69	.....	.....	211.0	338.8	62	56
Do	P.	.....	0	43	41	40	52	61	76	82	86	83	81	76	69	.....	.....	223.4	338.8	66	56
Rochester, N. Y	T.	.....	100	45	51	64	65	67	73	73	72	57	53	44	50	.....	.....	306.9	342.2	90	52
St. Louis, Mo	T.	.....	75	50	64	79	83	91	87	86	86	85	74	74	72	.....	.....	273.1	346.3	79	70
Salt Lake City, Utah	P.	.....	80	57	61	83	83	85	84	78	82	82	79	74	61	.....	.....	265.4	343.8	77	61
San Diego, Cal	P.	.....	35	17	28	37	50	75	81	80	86	86	86	77	67	.....	.....	227.0	351.3	65	56
San Francisco, Cal	T.	.....	0	1	25	39	59	70	79	93	96	93	92	60	32	.....	.....	222.7	347.3	64	62
Santa Fe, N. Mex	P.	.....	0	63	77	84	86	83	82	87	86	83	80	72	66	.....	.....	279.4	349.2	80	68
Savannah, Ga	P.	.....	75	59	70	83	83	82	80	78	83	80	73	68	61	.....	.....	267.2	352.4	76	69
Vicksburg, Miss	T.	.....	50	61	64	80	86	87	87	87	88	85	83	78	78	.....	.....	283.1	351.8	80	78
Washington, D. C	P.	.....	100	58	59	79	82	81	81	88	91	87	85	78	80	.....	.....	274.7	346.0	79	84
Wilmington, N. C	T.	.....	83	32	59	74	82	84	84	84	85	86	78	64	42	.....	.....	256.0	350.5	73	73

TABLE XII.—*Hourly precipitation, October*, 1895.

Stations.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	Midnight.	Total.
Atlanta, Ga	0.11	0.07	0.07	0.04	0.09	0.11	0.07	0.02	0.06	T.	0.01	0.01	T.	0.00	T.	0.01	0.00	0.00	0.02	0.07	0.03	0.02	0.04	0.41	1.34
Baltimore, Md.*	0.04	0.08	0.09	0.03	0.01	0.01	0.00	0.00	0.10	0.14	0.18	0.10	0.13	0.15	0.19	0.15	0.13	0.11	0.07	0.03	0.01	0.01	T.	T.	2.32
Bismarck, N. Dak	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	T.	0.00	0.00	0.00	0.00	0.00	0.00	T.	0.00	0.00	0.00	0.01	T.	0.04	0.03	T.	0.08
Boston, Mass	0.13	0.36	0.34	0.17	0.11	0.18	0.07	0.22	0.07	0.28	0.10	0.42	0.14	0.15	0.24	0.53	0.48	0.44	0.77	0.49	0.23	0.32	0.51	0.70	7.35
Buffalo, N. Y	T.	0.01	0.03	0.02	0.05	0.09	0.09	0.11	0.11	0.10	0.16	0.12	0.09	0.03	0.04	0.11	0.01	0.14	0.10	0.21	0.23	0.06	0.05	0.02	1.98
Chicago, Ill	T.	T.	T.	T.	T.	T.	T.	0.01	0.00	T.	0.00	T.	T.	0.06	0.09	0.08	0.34	0.01	T.	0.01	0.01	0.02	T.	0.01	0.53
Cincinnati, Ohio	0.00	0.00	T.	0.02	0.04	0.04	0.04	0.06	T.	0.01	0.01	0.06	0.03	0.02	T.	0.08	0.03	0.04	0.05	0.11	0.01	T.	0.02	0.01	1.69
Cleveland, Ohio	0.09	0.01	T.	T.	0.07	0.03	T.	T.	0.01	0.08	0.26	0.06	0.05	0.07	0.11	0.10	0.14	0.20	0.06	0.07	0.10	0.08	0.03	0.01	1.69
Denver, Colo	0.04	0.04	0.01	0.02	0.02	0.04	0.03	0.03	0.03	0.01	0.02	0.02	T.	T.	T.	T.	0.02	0.02	0.01	0.04	0.32	0.20	0.12	0.09	1.13
Detroit, Mich	0.03	0.02	0.05	0.05	0.08	0.08	0.08	0.01	0.04	0.01	0.02	0.01	0.01	0.01	0.01	T.	T.	T.	0.00	0.00	0.01	T.	0.00	T.	0.56
Dodge City, Kans	T.	0.01	0.06	0.01	0.03	0.08	0.13	0.05	T.	0.03	0.05	0.04	T.	0.04	0.09	0.11	T.	0.03	0.06	0.11	0.05	0.01	0.17	0.01	1.09
Duluth, Minn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	T.	T.	T.	T.	0.02	T.	0.01	0.01	0.01	0.01	0.01	0.01	0.01	T.	T.	T.	0.00	0.09
Eastport, Me	0.16	0.03	0.00	0.02	0.05	0.06	0.04	0.05	0.03	0.12	0.03	0.02	0.01	0.02	0.04	0.06	0.07	0.09	0.08	0.02	0.04	0.03	0.01	0.04	1.15
Galveston, Tex	0.01	0.04	0.03	0.09	0.02	0.02	0.74	1.21	0.29	0.02	0.05	0.03	0.06	0.01	T.	0.03	0.27	0.03	0.03	0.11	T.	T.	0.03	0.01	3.13
Indianapolis, Ind	0.01	0.00	0.00	T.	T.	0.00	T.	T.	0.02	0.01	0.01	0.01	0.01	T.	0.00	0.00	0.08	0.35	0.05	0.21	0.05	T.	0.00	0.00	0.79
Jacksonville, Fla	0.00	0.00	0.09	0.00	0.00	0.00	0.01	0.11	0.03	T.	0.02	0.07	0.01	0.05	0.05	0.07	0.02	0.04	0.04	0.04	0.00	0.00	0.00	0.00	0.58
Jupiter, Fla	1.29	0.42	0.83	3.25	0.92	1.51	1.16	1.87	1.16	1.73	0.71	0.39	0.77	0.25	0.42	0.71	0.84	0.78	0.37	0.25	0.18	0.22	0.51	0.43	21.00
Kansas City, Mo	0.02	0.02	0.01	0.01	T.	0.03	0.01	0.00	T.	T.	0.00	T.	0.00	0.00	T.	0.00	0.00	T.	T.	T.	0.01	0.01	T.	T.	0.12
Key West, Fla	0.16	0.22	0.16	0.07	0.07	0.13	0.27	0.10	0.10	0.35	0.09	0.12	0.18	0.37	0.32	0.07	0.13	0.06	0.17	0.16	0.08	0.04	0.77	0.36	4.56
Little Rock, Ark	0.16	0.13	0.24	0.05	0.05	0.47	0.09	0.14	T.	0.05	0.07	T.	0.04	0.07	0.03	0.32	0.01	0.04	0.07	0.10	0.05	0.03	0.03	T.	2.23
Louisville, Ky	0.08	0.04	0.10	0.10	0.06	0.03	0.03	0.01	T.	T.	0.01	T.	0.02	0.03	0.02	0.04	0.00	0.01	0.11	0.10	0.02	T.	0.01	0.02	0.84
Memphis, Tenn	0.32	0.22	0.13	0.10	0.04	0.05	0.01	0.11	0.04	0.01	0.00	0.00	T.	0.07	0.05	0.19	0.11	0.03	0.04	0.09	0.07	0.15	0.03	0.31	2.17
Milwaukee, Wis	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	T.	T.	0.05	T.	0.12	0.10	0.05	0.03	0.02	0.02	0.03	0.05	0.04	T.	0.00	0.52
Nantucket, Mass	0.10	0.11	0.11	0.10	0.10	0.10	0.11	0.15	0.03	0.03	0.02	0.03	0.01	0.01	0.01	T.	0.01	0.03	0.01	0.03	0.12	0.29	0.23	0.30	3.04
Nashville, Tenn	0.12	0.08	0.10	0.06	0.02	0.07	0.05	0.12	0.14	0.07	0.09	0.03	0.01	T.	T.	0.07	0.21	0.10	0.03	0.01	0.05	0.05	0.02	0.06	1.58
New Orleans, La	0.11	0.12	0.01	T.	0.01	0.05	0.05	0.01	T.	T.	0.02	0.03	0.03	0.01	0.02	T.	0.07	0.05	0.03	0.08	0.02	T.	0.01	0.48	1.21
New York, N. Y	T.	0.00	T.	0.07	0.10	0.09	0.26	0.34	0.11	0.06	0.03	0.04	0.04	0.12	0.02	0.76	0.48	0.22	0.19	0.42	0.38	0.14	0.04	0.01	4.52
Norfolk, Va	0.00	0.00	0.00	0.05	0.05	0.01	0.01	0.19	0.18	0.12	0.16	0.31	0.27	0.40	0.21	0.01	0.01	0.01	0.01	0.00	0.00	0.03	0.00	0.00	2.00
Omaha, Nebr	0.01	0.01	0.01	0.01	0.01	T.	T.	T.	T.	0.00	0.00	0.00	0.00	0.00	T.	T.	T.	T.	T.	T.	0.00	0.00	0.00	T.	0.07
Philadelphia, Pa	0.12	0.17	0.04	0.04	0.01	0.02	0.02	0.02	0.07	0.14	0.31	0.17	0.24	0.08	0.08	0.18	0.23	0.22	0.27	0.23	0.10	0.02	T.	0.03	2.81
Pittsburg, Pa	0.03	0.03	0.02	0.00	0.01	0.00	0.00	T.	0.02	0.03	0.05	0.06	0.05	0.05	0.04	0.09	0.05	0.07	0.16	0.14	0.17	0.04	0.06	0.06	1.21
Portland, Me	0.11	0.06	0.06	0.34	0.03	0.00	0.00	0.00	T.	0.03	0.01	0.02	0.09	0.07	0.08	0.08	0.04	0.02	0.08	0.37	0.18	0.14	0.27	0.43	2.41
Portland, Oreg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	T.	0.00	0.00	T.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	T.	T.	0.00	0.00	0.00	T.
Rochester, N. Y	0.00	0.00	T.	0.04	0.01	0.01	T.	0.01	0.01	0.02	0.02	0.03	0.01	0.03	0.10	0.10	0.06	0.12	0.15	0.42	0.08	0.11	0.10	0.02	1.45
St. Louis, Mo	T.	0.06	0.01	0.00	0.00	0.00	T.	0.06	0.01	0.01	0.01	0.01	T.	0.01	T.	0.02	0.02	T.	0.00	T.	0.00	0.00	0.00	0.00	0.22
St. Paul, Minn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	T.	T.	T.	T.	0.01	T.	T.	T.	T.	0.02	0.03	0.01	0.02	T.	T.	T.	0.00	0.09
Salt Lake City, Utah	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	T.	0.03	0.02	0.01	0.01	0.01	0.01	0.11	0.01	0.01	T.	T.	0.00	0.33
San Diego, Cal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27
San Francisco, Cal	T.	0.00	T.	0.01	T.	0.00	0.00	T.	0.01	T.	0.01	T.	T.	0.01	0.01	T.	0.00	0.01	0.00	0.00	T.	T.	0.03	0.02	0.11
Savannah, Ga	0.00	0.00	0.00	0.00	0.00	0.00	T.	T.	T.	T.	T.	T.	0.02	0.01	0.01	0.01	0.34	0.51	0.17	0.00	0.01	0.01	T.	0.00	1.11
Seattle, Wash	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.01	0.01	T.	0.00	0.00	0.00	T.	0.00	0.00	0.02
Vicksburg, Miss	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	T.	0.00	0.00	0.00	T.	0.00	0.00	0.02
Washington, D. C	0.00	0.00	0.03	0.01	0.04	0.08	0.23	0.23	0.09	0.06	0.12	0.04	0.08	0.07	0.11	0.12	0.19	0.10	0.13	0.14	0.22	0.09	0.02	0.02	1.63
Wilmington, N. C.*	0.05	0.05	0.08	0.12	0.15	0.25	0.27	0.10	0.15	0.25	0.12	0.01	0.01	0.17	0.19	0.21	0.12	0.08	0.04	0.03	0.02	T.	0.00	0.00	1.95
														T.	0.00	T.	T.	0.00	0.00	0.01	T.	T.	0.02	0.03	1.67

* Record incomplete.

TABLE XIII.—*Excessive precipitation, by stations, for October, 1895.*

Stations.	Monthly rainfall 10 inches, or more.	Rainfall 2.50 inches, or more, in 24 hours.		Rainfall of 1 inch, or more, in one hour.		
		Amt.	Day.	Amt.	Time.	Day.
Arizona.	*Inches.*	*Inches.*		*Ins.*	*h. m.*	
Pinal Ranch		4.69	2-3			
Colorado.						
Smoky Hill Mine		2.50	3-4			
Connecticut.						
Canton		4.26	12-13			
Colchester		4.44	12-13			
Falls Village		3.06	12-13			
Hartford *b*		2.60	12-13			
Lake Konomoc		2.63	12-13			
Middletown		2.55	12-13			
North Franklin		4.80	12-13			
North Grosvenor Dale		6.93	12-13			
Storrs		5.26	12-13			
Voluntown		4.95	12-13			
Wallingford		3.89	12-13			
West Simsbury		4.15	12-13			
Windsor		4.56	12-13			
Florida.						
Fort Meade		2.50	14			
Frostproof		4.00	15			
Hypoluxo	24.39	7.50	20-21			
Do		7.50	28	7.50	5 00	28
Grasmere		4.30	15			
Jupiter	21.06	4.60	17-18	1.56	1 00	10
Do		6.94	20-22	1.16	1 00	15
Do				1.13	1 00	18
Do				1.09	1 00	20
Merritts Island		2.90	15			
Orlando		2.56	14-15			
Tampa		2.78	15			
Titusville		2.58	22-23			
Kentucky.						
Alpha				1.40	0 10	27
Louisiana.						
Abbeville		3.35	30			
Baton Rouge		3.30	30-31			
Coushatta *a*		4.73	30			
Coushatta *b*		4.81	30			
Franklin		3.95	30			
Grand Coteau		4.60	30			
Jeanerette		3.37	30			
Liberty Hill		2.51	30			
New Iberia		3.60	30			
Opelousas		2.65	30-31			
Oxford		2.62	30			
Massachusetts.						
Amherst Experiment Station *b*		2.68	12-13			
Andover		5.49	12-13			
Ashland	10.13	7.50	12-14			
Beverly Farms		7.28	12-14			
Blue Hill (summit)		5.92	13			
Boston (W. B.)		4.92	12-13			
Brockton *a*		3.92	13			
Brockton *b*		5.00	12-13			
Cambridge *a*	10.00	6.75	12-13			
Cambridge *b*	10.16	6.88	12-13			
Do		2.87	31			
Chestnut Hill		7.55	12-14			
Clinton		7.65	13-14			
Cohasset		4.77	12-13			
Do		3.30	31			
Concord		4.74	13			
Dudley		2.50	12-13			
Fall River		3.00	12-13			
Fiskdale		5.38	12-13			
Fitchburg *a*		4.92	12-13			
Fitchburg *b*		4.57	12-13			
Framingham	11.23	8.40	12-14			
Groton		3.48	13			
Hingham		5.38	12-13			
Hobbs Brook		7.07	12-14			

TABLE XIII.—*Excessive precipitation*—Continued.

Stations.	Monthly rainfall 10 inches, or more.	Rainfall 2.50 inches, or more, in 24 hours.		Rainfall of 1 inch, or more, in one hour.		
		Amt.	Day.	Amt.	Time.	Day.
Massachusetts—Cont'd.	*Inches.*	*Inches.*		*Ins.*	*h. m.*	
Lake Cochituate		6.95	12-13			
Lawrence		4.82	12-14			
Leeds		3.96	12-13			
Leominster		4.26	13			
Long Plain		3.64	12-13			
Lowell *a*		6.33	12-13			
Ludlow Center		4.25	12-13			
Mansfield		4.70	12-13			
Middleboro		3.30	12-13			
Milton		6.33	12-14			
Do		3.03	31			
Monroe		2.72	12-13			
Monson		5.25	12-13			
Mount Nonotuck		3.08	12-13			
Mount Wachusett		6.29	12-13			
Mystic Lake	10.69	7.33	12-14			
Do		2.89	31			
Natick		8.00	12-13			
New Bedford *a*		3.14	12-13			
North Billerica		6.45	12-14			
Plymouth		4.72	12-13			
Roberts Dam		6.81	12-14			
Roxbury		6.75	12-14			
Salem		5.27	12-14			
Do		3.54	31			
Salisbury		2.85	13			
Somerset		4.36	12-13			
Taunton *a*		4.09	12-13			
Wakefield		6.60	12-13			
Waltham	11.08	8.22	12-13			
Webster		6.72	12-14			
Westboro		8.25	12-14			
Winchester		6.72	12-14			
Worcester *b*		7.54	12-13			
Mississippi.						
Moss Point		4.75	12			
New Hampshire.						
Brookline		5.40	12-13			
Concord		3.20	12-13			
Dublin		4.63	12-14			
Durham		4.14	12-13			
Newton		3.71	12-13			
Peterboro		5.00	12-13			
New Jersey.						
Chester		4.23	12-13			
Junction		3.00	12-13			
New York.						
Honeymead Brook		2.52	12-13			
Middletown		2.70	12-13			
Do		2.91	29			
Pennsylvania.						
Coopersburg		2.70	12-13			
Rhode Island.						
Block Island		3.46	12-13			
Bristol		3.00	12-13			
Kingston		4.07	12-13			
Lonsdale		5.27	12-13			
Pawtucket		5.12	12-14			
Providence *a*		5.28	12-14			
Providence *c*		5.23	12-14			
Texas.						
Abilene				1.10	1 00	6
Brenham				1.18	1 00	7
Corsicana *a*		2.59	3-4			
Galveston				1.19	1 00	30
Huntsville		3.10	31			
Lampasas		3.20	29-30			
Longview		2.50	7			
Marshall		2.95	7			
Temple		4.00	29			

TABLE XIV.—*Maximum rainfall in one hour or less, October*, 1895.

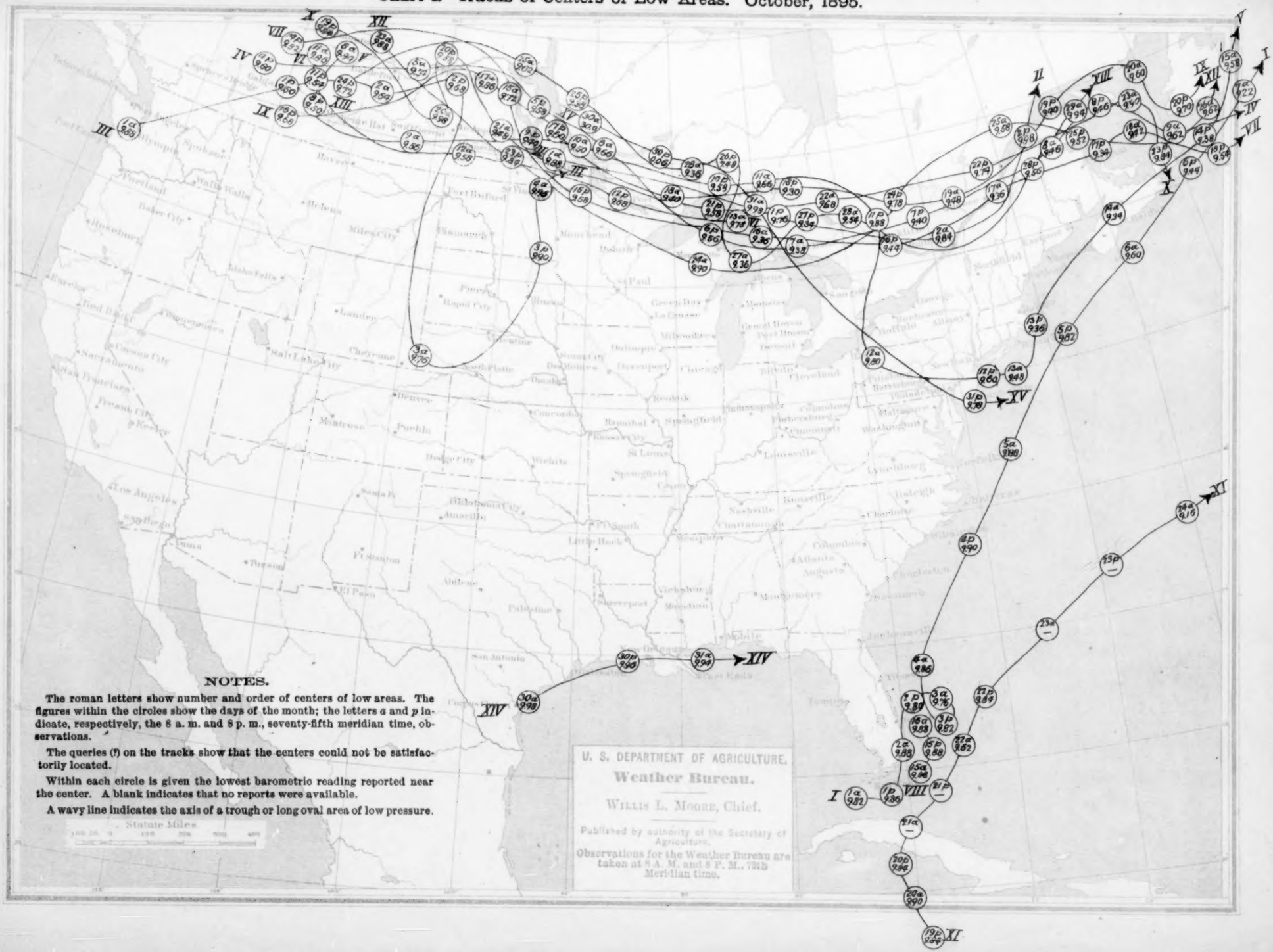
Stations.	Maximum rainfall in—					
	5 min.	Date.	10 min.	Date.	1 hour.	Date.
	Inch.		*Inch.*		*Inch.*	
Atlanta, Ga.	0.12	7	0.16	7	0.34	7
Baltimore, Md.*						
Bismarck, N. Dak.					0.04	10
Boston, Mass.	0.10	13	0.19	13	0.70	13
Buffalo, N. Y.	0.14	27	0.27	27	0.29	27
Chicago, Ill.	0.03	6	0.05	6	0.18	6
Cincinnati, Ohio	0.06	11	0.07	11	0.10	11
Cleveland, Ohio	0.15	12	0.17	12	0.26	12
Denver, Colo	0.02	3	0.05	3	0.25	3
Detroit, Mich	0.01	12	0.02	12	0.07	12
Dodge City, Kans.	0.04	29	0.06	29	0.15	29
Duluth, Minn.					0.02	10
Eastport, Me	0.06	28	0.08	28	0.16	14
Galveston, Tex.	0.20	30	0.35	30	1.19	30
Indianapolis, Ind	0.07	6	0.14	6	0.29	11
Jacksonville, Fla	0.01	15	0.02	15	0.11	15
Jupiter, Fla.	0.33	10, 15	0.63	10	1.55	10
Kansas City, Mo					0.02	4
Key West, Fla.	0.25	10	0.42	10	0.85	10
Little Rock, Ark.	0.15	27	0.19	27	0.47	27
Louisville, Ky.	0.02	31	0.03	31	0.11	31
Marquette, Mich.	0.05	7	0.10	7	0.23	10
Memphis, Tenn.	0.09	26	0.12	26	0.37	26
Milwaukee, Wis.*						

TABLE XIV.—*Maximum rainfall*—Continued.

Stations.	Maximum rainfall in—					
	5 min.	Date.	10 min.	Date.	1 hour.	Date.
	Inch.		*Inch.*		*Inch.*	
Nantucket, Mass	0.03	12	0.05	12	0.22	12
Nashville, Tenn.	0.05	7	0.08	7	0.21	7
New Orleans, La.	0.15	30	0.22	30	0.50	30
New York, N. Y.	0.12	12	0.21	12	0.90	12
Norfolk, Va.	0.06	31	0.11	31	0.40	31
Omaha, Nebr.					0.01	4
Philadelphia, Pa.	0.03	31	0.05	31	0.20	31
Pittsburg, Pa	0.10	27	0.11	27	0.12	27
Portland, Me.	0.08	12	0.13	12	0.25	13
Portland, Oreg.†						
Rochester, N. Y.	0.06	7	0.08	7	0.20	7
St. Louis, Mo.	0.03	6	0.04	6	0.06	6
St. Paul, Minn.†						
Salt Lake City, Utah	0.02	3	0.04	3	0.11	3
San Diego, Cal.					0.22	21
San Francisco, Cal.†						
Savannah, Ga.	0.17	31	0.30	31	0.65	31
Seattle, Wash.†						
Vicksburg, Miss.	0.12	7	0.15	7	0.24	7
Washington, D. C.	0.05	12	0.09	12	0.22	12
Wilmington, N. C.*						

* Record incomplete. † Less than 0.05 in one hour.

Chart I. Tracks of Centers of Low Areas. October, 1895.



NOTES.

The roman letters show number and order of centers of low areas. The figures within the circles show the days of the month; the letters *a* and *p* indicate, respectively, the 8 a. m. and 8 p. m., seventy-fifth meridian time, observations.

The queries (?) on the tracks show that the centers could not be satisfactorily located.

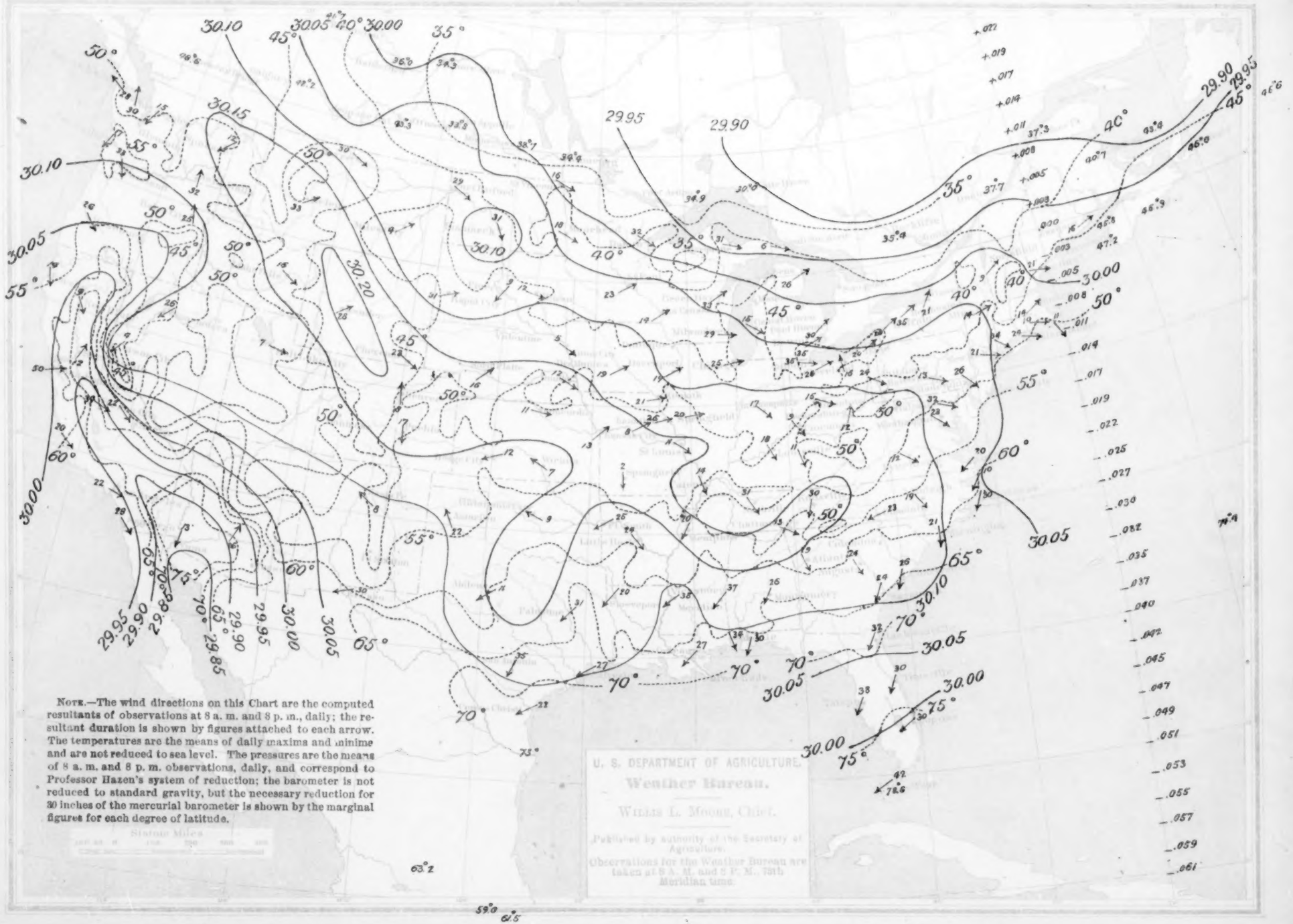
Within each circle is given the lowest barometric reading reported near the center. A blank indicates that no reports were available.

A wavy line indicates the axis of a trough or long oval area of low pressure.

Statute Miles

U. S. DEPARTMENT OF AGRICULTURE.
Weather Bureau.
WILLIS L. MOORE, Chief.
Published by authority of the Secretary of Agriculture.
Observations for the Weather Bureau are taken at 8 A. M. and 8 P. M., 75th Meridian time.

Chart II. Isobars, Isotherms, and Resultant Winds. October, 1895.



NOTE.—The wind directions on this Chart are the computed resultants of observations at 8 a. m. and 8 p. m., daily; the resultant duration is shown by figures attached to each arrow. The temperatures are the means of daily maxima and minima and are not reduced to sea level. The pressures are the means of 8 a. m. and 8 p. m. observations, daily, and correspond to Professor Hazen's system of reduction; the barometer is not reduced to standard gravity, but the necessary reduction for 30 inches of the mercurial barometer is shown by the marginal figures for each degree of latitude.

Chart III. Total Precipitation. October, 1895.

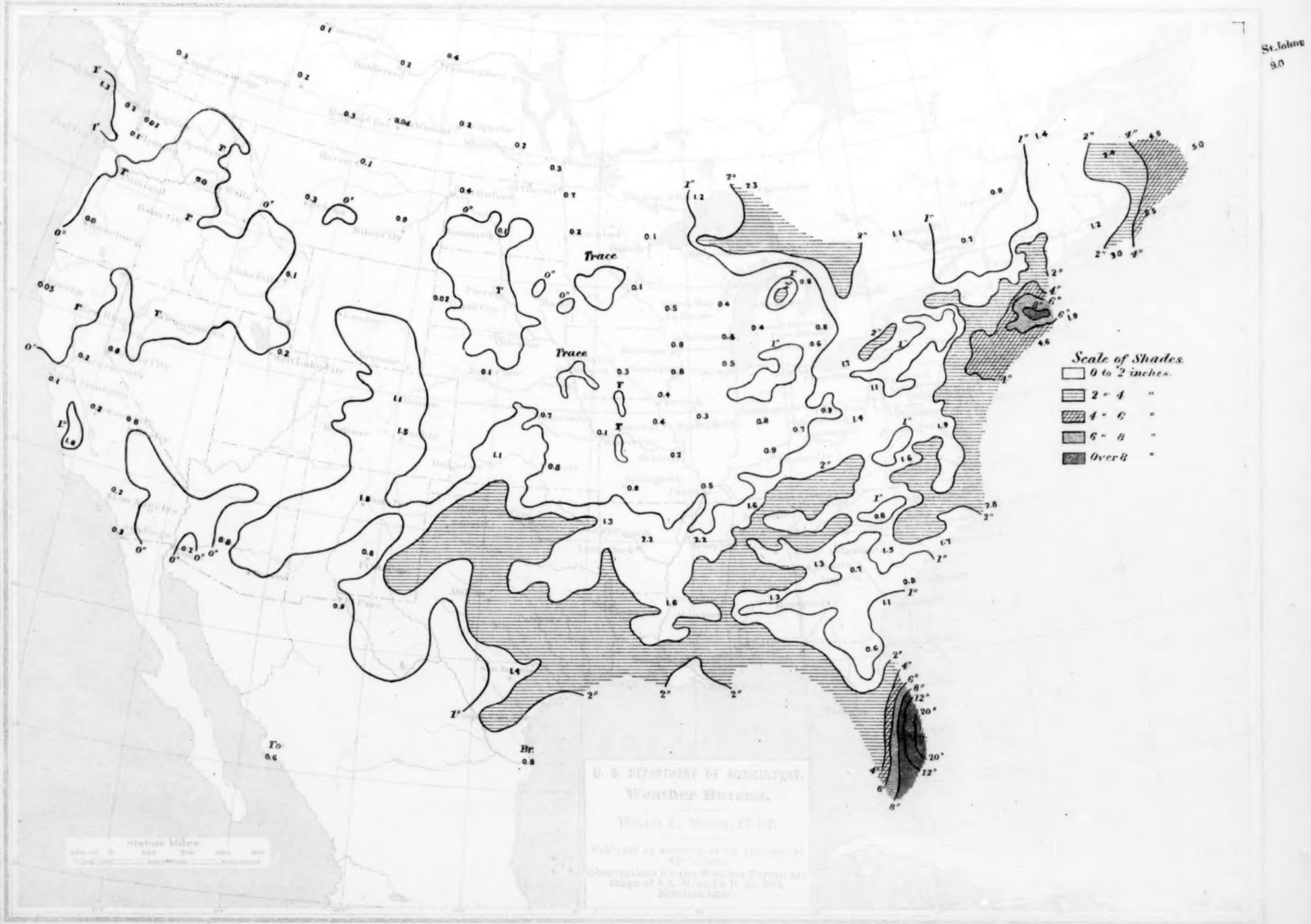
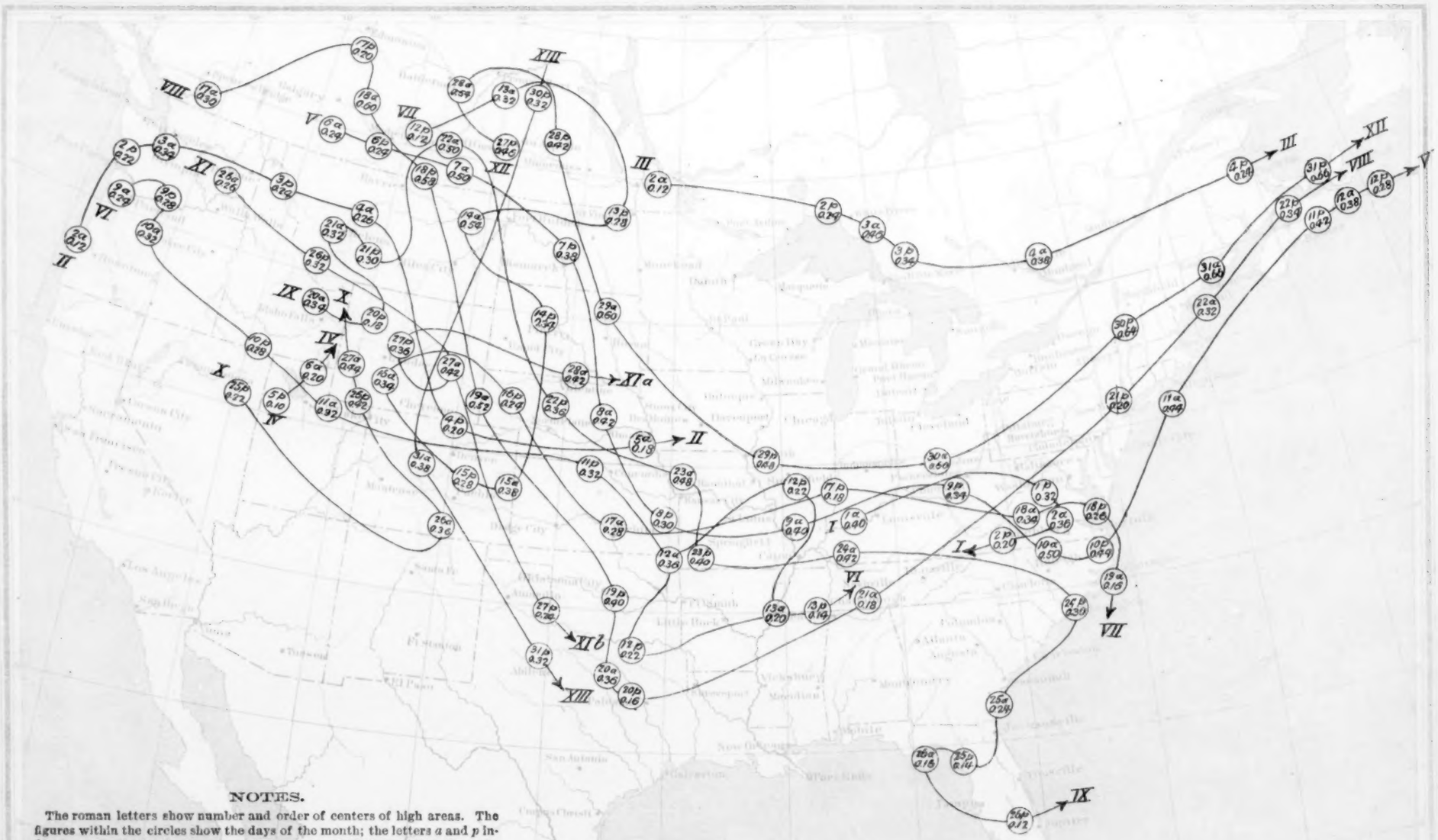


Chart IV. Tracks of Centers of High Areas. October, 1895.



NOTES.

The roman letters show number and order of centers of high areas. The figures within the circles show the days of the month; the letters *a* and *p* indicate, respectively, the 8 a. m. and 8 p. m., seventy-fifth meridian time, observations.

The queries (?) on the tracks show that the centers could not be satisfactorily located.

Within each circle is given the highest barometric reading reported near the center. A blank indicates that no reports were available.

A wavy line indicates the axis of a ridge of high pressure.

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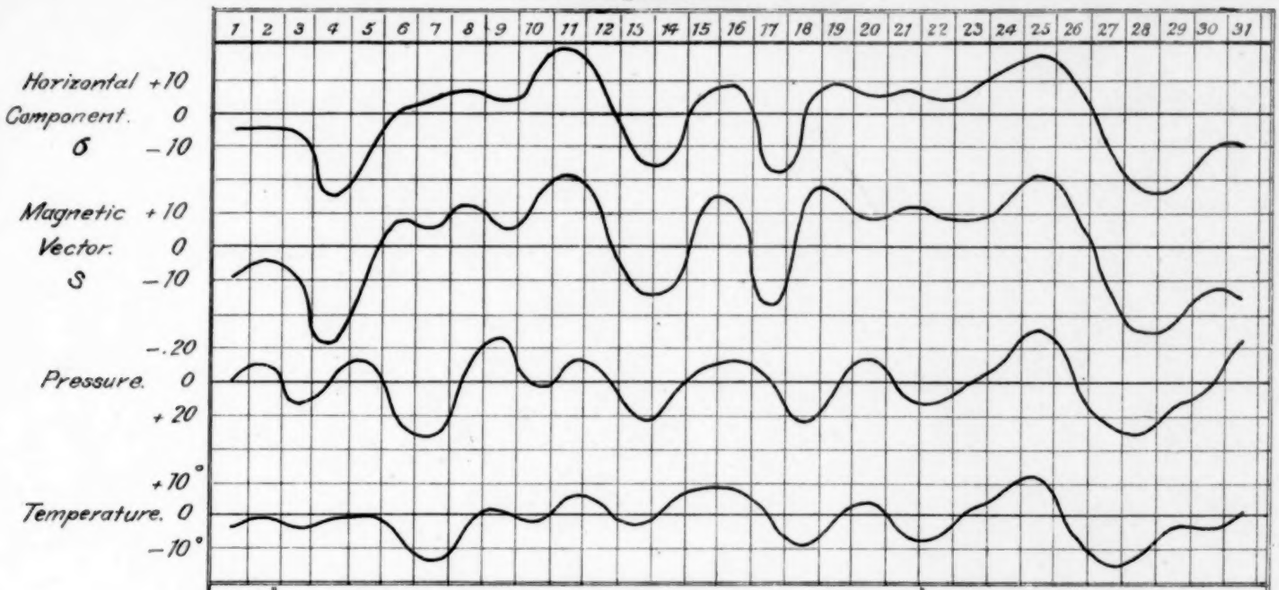
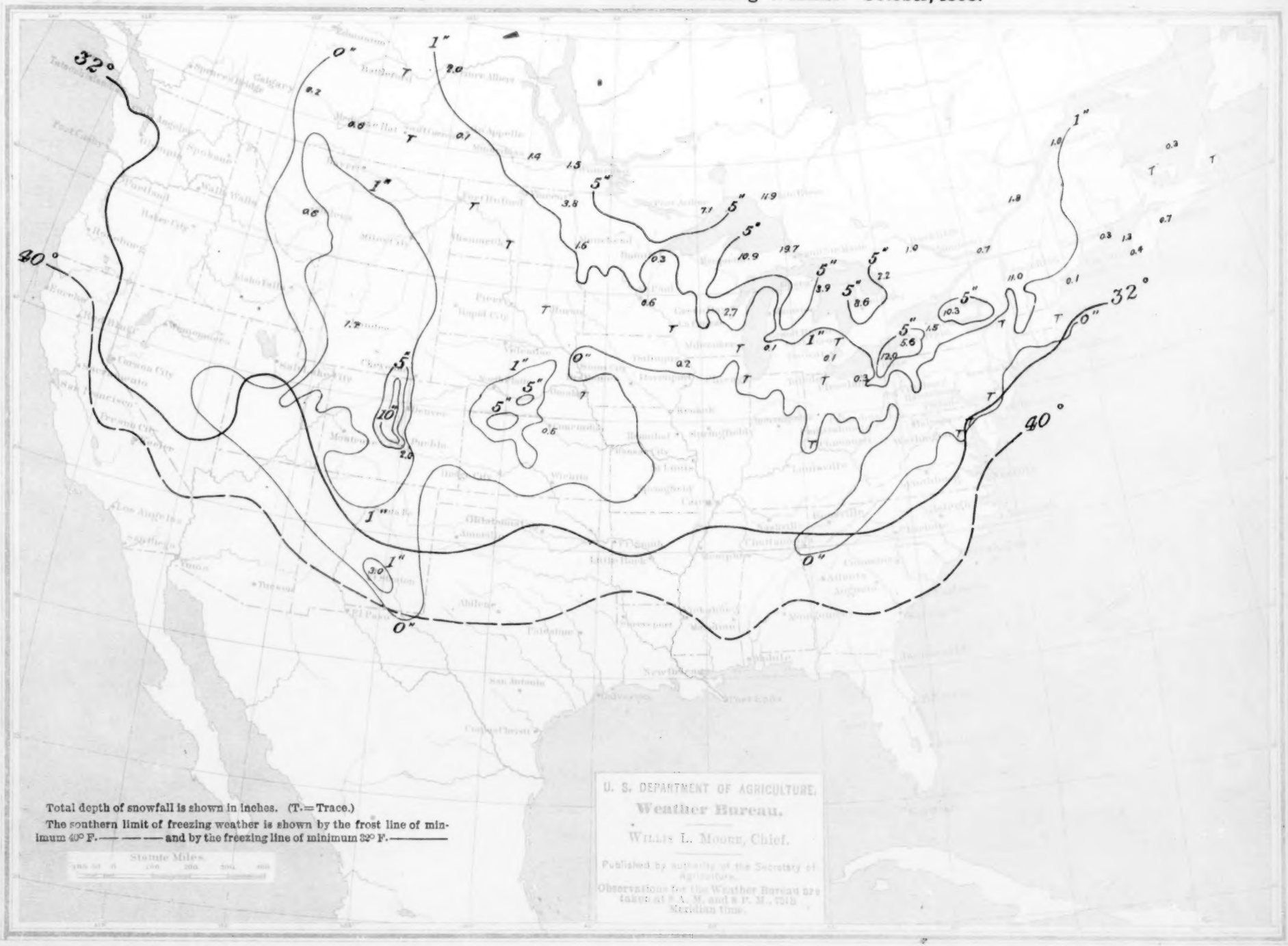
Chart V. Relative Variations of the Horizontal Magnetic Force and the Northwest Pressures and Temperatures.



October 95.	Washington and Toronto. Deflecting Magnetic Forces.										Northwest. Pressure.		Northwest. Temperature.	
	H	D	V	dx.	dy.	dz.	δ	S	α	β	P	ΔP	T	ΔT
1	53	6.3	107	−2	−4	−8	−4	−9	−64°	245°	29.94	0	49	−2
2	53	7.6	114	−2	+3	+1	−4	−4	+15	123	29.85	−9	50	0
3	51	7.6	104	−4	+3	−7	−5	−9	−55	142	30.08	+13	46	−3
4	32	5.7	123	−23	−7	+15	−24	−29	+32	197	29.92	−4	49	0
5	47	8.0	106	−8	+5	0	−9	−9	0	148	29.82	−15	48	0
6	55	7.3	95	0	+1	−8	+1	+8	−83	90	30.20	+22	42	−5
7	58	8.0	104	+3	+4	+3	+5	+6	+32	52	30.27	+29	33	−14
8	54	8.6	106	0	+7	+8	+7	+11	+49	90	29.87	−12	44	−2
9	58	7.8	98	+4	+3	+2	+5	+5	+23	36	29.74	−26	47	+2
10	68	7.1	98	+14	−2	+5	+14	+15	+20	352	30.01	+1	43	−1
11	73	7.0	84	+19	−2	−7	+19	+20	−20	354	29.88	−13	50	+6
12	57	6.5	87	+3	−5	−1	+6	+6	−10	302	29.97	−5	45	+2
13	41	7.7	92	−12	+1	+6	−12	−14	+27	175	30.24	+22	41	−1
14	49	5.2	79	−4	−12	−4	−13	−14	−17	252	30.08	+5	45	+4
15	55	8.7	69	+2	+6	−12	+6	+14	−63	71	29.99	−5	49	+9
16	59	8.9	68	+6	+6	−10	+8	+13	−51	44	29.91	−14	46	+6
17	44	10.5	43	−9	+14	−33	−17	−37	−62	123	30.01	−4	39	0
18	56	7.5	56	+4	−2	−17	+4	+18	−77	334	30.31	+25	30	−8
19	61	7.7	60	+9	−1	−11	+9	+14	−51	354	30.07	0	38	+1
20	57	7.4	63	+5	−3	−5	+6	+8	−40	330	29.90	−17	40	+4
21	59	7.9	58	+7	0	−8	+7	+11	−49	0	30.19	+11	31	−4
22	56	7.8	55	+4	+1	−8	+4	+9	−64	15	30.20	+11	30	−5
23	60	7.9	57	+8	+1	−4	+8	+9	−27	7	30.07	−3	37	+3
24	63	7.3	54	+12	−4	−4	+13	+14	−17	341	29.96	−14	40	+7
25	69	7.8	46	+18	−2	−10	+18	+21	−29	354	29.78	−33	44	+12
26	58	7.9	53	+7	−2	0	+7	+7	0	349	30.06	−5	27	−5
27	39	8.5	56	−12	+2	+5	−12	−13	+23	170	30.33	+21	18	−13
28	27	8.6	56	−24	+2	+3	−24	−25	+8	175	30.41	+28	19	−11
29	28	8.1	58	−22	−1	+3	−22	−23	+7	183	30.24	+10	27	−2
30	40	7.5	63	−10	−5	+5	−11	−12	+24	202	30.21	+7	25	−4
31	41	7.9	72	−9	−3	+12	−10	−16	+50	198	29.91	−24	30	+2

Chart VI. Depth of Snowfall and Limits of Freezing Weather - October 1925

Chart VI. Depth of Snowfall and Limits of Freezing Weather. October, 1895.



Total depth of snowfall is shown in inches. (T. = Trace.)

The southern limit of freezing weather is shown by the frost line of minimum 40° F. — — — and by the freezing line of minimum 32° F. ————

Statute Miles

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